The magazine for AUSTRALIAN AMATEURS

May 2004
Volume 72 No 5

Amateur Radio

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Winter at Mt Baw Baw

This issue featuring

Ham radio internet repeater linking
Ian Abel G3ZHI

Raft radio
Mike Patterson VK4M1K

Elementary RF Vector Network Analysis using a HP8410B
Richard Sawday VK5ZLR

An active receiving loop antenna for 1.8 MHz
Drew Diamond VK3XU

The EH antenna
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Amateur Radio

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Our Cover this month

The VK3RWG 2 metre repeater site at Mt Baw Baw in Gippsland in August last year. Photo courtesy of Chris Morley VK3KME, Secretary,WIA Eastern Zone Amateur Radio Club. See Chris's story and more photos inside back cover

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Editorial comment

Colwyn Low VK5UE

The New WIA

I suppose it was too much to expect all to be agreed at the first session of the 2004 WIA Federal Convention. I also believe it is better to wait a bit, even if it was a year, to let every one get their head around what is being suggested, what the benefits will be and what will change. We have also got to be sure we have a group of committed people to run the new organisation. It seems to me that the most important position in the new WIA will be that of a full time executive officer.

I cannot see how the organisation can be run efficiently, and properly, by volunteer managers and part time staff. The executive officer would have to be an amateur who has a broad-based background in management and a fair knowledge of amateur radio.

Where the national office should be, will be similar to the problem Australia had at federation in selecting a capital. I hope by the time you read this, we will have an idea of where we are going.

Things 'amateur' we can all do now

No matter what happens to the structure, it is most necessary that we all try to recruit some new members to the hobby and also hopefully the WIA. There is no use telling young people or for that matter retirees that amateur radio will give them the same facilities as a mobile phone, it will not.

When I was young, amateur radio was the only way you and your friends could contact each other on the move. When I said to someone recently "What did amateur radio offer?" Their reply was the opportunity to make new friends from all over the world. This is certainly true and we all know of chance QSOs that ended up with frequent contacts and a long-term friendship. We also have the chance to meet more people locally. I read a number of club magazines and some clubs have a very good social program so that our families can meet other members and their families.

There is also the facility to help your local community through WICEN and in some cases the amateurs are the SES or CFS radio operators. There are conditions where the amateur networks work better than the government networks because they have knowledgeable operators and can flexibly reconfigure their networks to best suit the situation being served.

I did get things together and worked a few numbers for the Harry Angel Sprint. I really will have to do something with the 80 metre aerial systems. Then, if I can hear them better and radiate more efficiently, perhaps I can work more stations and win a section of the contest! But then the satisfaction is in the precipitation, not the possible trophy

Finally there is the challenge of building up a station. Selecting the components which best suit your interests HF –UHF, QRP – QRO, Digital – Analogue, big and bulky - small and neat the list goes on and on. There is the chance to talk to people on the ground close by or far away, to the Astronauts on the ISS or to listen to the signals from the Mars Rovers. Lots of challenges and lots of satisfaction and pleasure from taking them on and winning.

Lastly I did get things together and worked a few numbers for the Harry Angel Sprint. I really will have to do something with the 80 metre aerial systems. Then, if I can hear them better and radiate more efficiently, perhaps I can work more stations and win a section of the contest! But then the satisfaction is in the precipitation, not the possible trophy (well!).

Well now we are into winter it is a good time to refurbish some equipment, design new accessories and plan to do some operating on a new band in a new mode. Good luck in the quest.

73 Colwyn VK5UE

WIA Comment

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Federal WIA AGM

I'd like to start this month's AR notes with a big "thank you" to all of the members of the VK4 division who helped to make the 2004 Federal WIA AGM a success. Thanks are due in particular to Ken Fuller VK4KF for offering to take the meeting minutes as well as helping out with a large amount of administrative support. And of course not to be forgotten is our own June Fox from the Federal Office who worked up until the last minute to ensure that the accounts, reports and all of the paraphernalia of the WIA AGM were ready on time. Thank you to Ken, June, and everyone who else who helped out.

So what happened? The main topic of discussion over the weekend was the question of whether we should become a National WIA rather than the federation of separate Divisions that it is at the moment. In other words the current Federal WIA has only 7 members who are the 7 Divisional councillors. Individual members are affiliated with a regionally based Division. There was strong support for the proposal but at this stage a number of outstanding questions remain. A significant amount of time was spent on the issue of the so called transition arrangements. How exactly will each of the current Divisions transfer it's membership and responsibilities to a national body? This discussion was led by Michael Owen VK3KI. There has been some comment that this transition document was not available before the meeting started. This was simply not an option since the transition plan is something that has to be agreed amongst all of the Divisions. As such the meeting was used as a forum to garner the views of each of the divisions so that everyone present could understand the intricacies involved in the transition arrangements. To have done this outside of the meeting or by email would have been almost impossible and extremely time consuming.

Having dealt with the complexities of the transition arrangements there was a strong feeling that Divisional councillors wished to discussed the details with their respective councils. As a result the AGM was adjourned until 1 May 2004. This adjourned meeting will be held in Paramatta where the one outstanding AGM issue is the special resolution on the adoption of a new National WIA constitution.

The 2004 AGM was notable for a number of other reasons. Among these was the presence of David Wardlaw VK3ADW. David was present in an official, and sadly his last, IARU capacity. It was a fitting end to many years of effort on behalf of amateur radio and I'm sure that you will all join me in saying thank you to him for these efforts as well as wishing David well for the future.

Also present was Michael Owen VK3KI. Michael brought to the attention of the council the importance of the WIA contribution to WRC 2003. Michael was able to provide an invaluable insight into the role played by the both David Wardlaw VK3ADW and Keith Malcolm VK1AKM who presented the amateur radio viewpoint as part of the Australian delegation. It was heart warming to hear how important their contributions have been. Thanks also to all of you who contributed funds towards being able to send the WIA delegation to WRC 2003. It is good to be able to provide this sort of feedback to you to confirm the real value that these contributions have made to furthering the hobby.

Most of the other activities at the AGM seemed somehow much less momentous; partly I suspect because of the huge ramifications that the adoption of a National WIA would have upon future policy and operations.

The AGM did have its moments. This year saw David Jones VK4OF not being re-elected to his position on the executive as a director. I would like to ask you all to reflect on the immense efforts that David has put into AR both as a VK4 divisional councillor and over the last year as a director of the Federal body. His most recent *tour de force* was the petitioning of the Joondalup Council in respect of mast and covenants in the council area. So; thank you David on behalf of all of us at the Federal WIA.

Also sadly David Piley VK2AYD tendered his resignation at the AGM. David has indicated that he will continue to support the Federal body and any national body that may arise in the future although not as a director. David has been acting as the Federal WIA treasurer for the last 3 years. He has made an immense behind the scenes contribution to the operation of the Federal body. Thank you David.

On a more upbeat note I am pleased to report that John Martin was made a life member of the Federal WIA for his contribution over many years as Chairman of the Federal Technical Advisory Committee. Well done John, you are another quiet achiever working behind the scenes to promote amateur radio. I am also delighted to announce that Gil Sones VK3AUI has been posthumously awarded the Higginbottom Medal in recognition of his contribution over many years.

The future

As I write these notes the question upper most in my mind is where to next. At this time I am aware of a considerable amount of activity across Australia:

- In VK3 extensive debates are being held in conjunction with presentations by Michael Owen on the transition proposals at various clubs.
- The VK2 AGM was held on 17 April and initial analysis shows around 95% support for the national body. This confirms the general trends of reports that I receive from a range of quarters.
- In the west; the VK6 AGM appears to have voted against the proposed new constitution and implementation plan (although I have not heard this officially and I suspect we all need to look at exactly what they have voted for).

So the next few weeks and months look to maintain the interest and excitement of recent months. Hopefully, by the time I get to write AR notes for June, I will be able to report the outcome of the debate which ever way it goes.

I'll bring these notes to a close and wish 73s to you all. I look forward to hearing your comments, either directly or via the divisions. All the best in amateur radio.

ar

Ham radio internet repeater linking

Ian Abel G3ZHI

It is now common for those on the Internet to communicate with friends and family around the world using voice and video, which requires their computer to have a camera, microphone and soundcard fitted.

For radio hams the next step was to link their FM VHF or UHF transceiver to the computer sound card enabling audio from their transceiver onto the Internet. If a similar link was taking place on a remote computer and both computers were linked together via the Internet (in the UK or anywhere in the world) you could have a radio to radio QSO with the Internet providing the link in the middle.

The transceiver could be operating on either a local VHF or UHF repeater, or an FM simplex channel. All Internet linking on repeaters takes place in the shack of the ham providing the link, nothing is done at the repeater site. The audio quality is normally excellent. DX stations sound just like locals.

With the more liberal ham radio laws in the USA and Canada, Internet repeater linking has been in use there for more than 6 years. The first program used was Vocaltecs' IPHONE but any program that allows audio over the Internet e.g. MSN Messenger or Paltak can be used for linking and provide basic radio communication.

This would be done by holding the transceivers' microphone to the computer speaker and transmitting the audio off the Internet over the air, then holding the computer microphone to the transceivers' speaker and transmitting the audio over the Internet.

The TX/RX change over would be made by manually pressing the PTT but with more sophisticated programs like IRLP the TX/RX change over is done automatically using an interface board and the transceivers 'COS' (carrier operated switch) data line, allowing repeaters to be connected to the Internet 24 x 7.

In the UK permission to link Ham radio to the Internet had to be obtained from the Radiocommunications Agency and a personal request was made by Ian Abel G3ZHI to David Hendon G8DPQ their Chief Executive at RA Road Show in Leeds October 1999. David Hendon gave his permission in January 2000.

There are currently four Internet linking systems in use IPHONE, iLINK, eQSO and IRLP. The first three run under Windows 95 and above and each program can be downloaded from my web site. IRLP runs under Linux Redhat 6.2 (this version only). For those not familiar with Linux the UKIRLP Group are willing to help with installing Linux and the IRLP software. Using Linux is straightforward when the Graphical User Interface (GNOME) is also installed , as the Desktop looks similar to the Windows Desktop.

As of April 2002 185 NoVs have been issued for simplex Internet gateways.

74 2m
111 70cm
1 70cm 7.6MHz split repeater

Getting connected (UK specific)

If you wish to install an Internet gateway you first need to apply to the RA for a Notice of Variation (NoV) to your Amateur Radio Licence. For a simplex link the application can be made on line on the RSGB DCC web site. The site lists all the 2m and 70cm frequencies available.

If you wish to put the link on a repeater you must first obtain the permission (in writing) of the keeper and then send a written application to the RSGB RMC Chairman Carlos Eavis G0AKI QTHR supplying all the information required for a simplex link, plus the callsign of the repeater you wish to put the link on, a copy of your licence validation document and the written permission of the keeper.

You could install your own 70cm 7.6 MHz split repeater and install an Internet link on it. 7.6 MHz repeaters are 'fast track' repeaters, as the application is processed quicker than a normal repeater application.

Some software changes will probably have to be made to the repeater logic as no repeater identification must be sent over the Internet, as it causes problems with the other repeaters that are connected producing a 'ping-pong' effect (repeaters continuously keying each other on and off). The logic must also be capable of operating CTCSS.

As Internet linking is worldwide, hams in many different time zones help to police the links 24 x 7 and any problems are reported to the stations providing the links.

Contacts

Using an Internet link DX stations can be worked from home, while out walking, or bicycling using a hand-held. A typical example is to have a roundtable QSO with hams on repeaters in the U.S.A, Canada, South Africa, The Caribbean and Australia all in the same QSO.

Some American repeaters transmit simultaneously on multiple frequencies e.g. 2m 6m 10m 220MHz and 70cm so you can be transmitting on many different frequencies all at the same time.

NOTE

This article refers to systems set up under UK licences. Some frequencies etc are not available in Australia. Operating software which allows the possibility of unlicensed persons communicating over Amateur Radio Frequencies are not permitted in Australia.
Editor.

The most remote place on IRLP is the American Mc Murdo Base in Antarctica. The base has a 'live cam', http://live7.truelook.com/nasa/mcmurdo/index.jsp camera, which you can control, the picture quality is very good. For 6 months of the year the base is in 24-hour daylight so with a little organisation it would be possible to see the person you are talking to, if they stood in front of the camera. I have done this here from Sheffield and stood in front of one of the 'live cams' cameras on Sheffield University, while talking to hams on IRLP who were able to see me.

Some overseas repeater linked systems are very sophisticated with many repeaters linked together by RF. In New Zealand for instance they have the 70cm National System that has 19 repeaters linked together, providing nearly full coverage of both the North and South Islands. In 2001 when Tony Whitaker G3RKL was walking the length of the country (top to bottom 1,300 miles) I was able to keep in touch with him daily, while he was on his walk and patch him through to his local repeater GB3US in Sheffield (Tony is the keeper) to talk to his friends.

In the U.S.A. and Canada there are a number of linked systems. One example is the Winsystem in California which links San Diego to San Francisco via 17 mountain top repeaters (some over 8.000 feet high) all linked together.

Another repeater with excellent coverage is the Tram repeater in Palm Springs California , so called because the Tram goes to the top of the mountain where the repeater is. Also on the top of the mountain there is a 'live cam' which is next to the repeater site, which you can view from the Tram web site http://www.pstramway.com/ and enjoy the beautiful scenery and see the repeater coverage.

In the future maybe all repeaters in the world will be linked to the Internet enabling hams to keep in touch with ham friends visiting any city in the world that has a repeater.

Internet linking is ideal for long QSOs making it possible to have in-depth discussions unaffected by QRM or QSB.

G3ZHI has given a number of talks to radio clubs in the U.K. and around the world using Internet radio linking. It could be used by any ham to give a club talk on any subject.

Contacts can be 'one to one' or in a 'round table' where many repeaters are linked together. Sometimes on IRLP 30 repeaters can be linked and all the users on each repeater are able to hear each other.

For elderly hams that are no longer able to look after their aerials and towers, or hams that go into retirement homes, this is an excellent way for them to keep in touch with ham friends. I recently worked one ham in the USA who was 92 and using a handheld from a retirement home. Some retirement homes will permit computers and handheld radios but not a HF radio plus aerials.

While you are at work, university, school or at an Internet café, providing the computer you are using has a microphone and soundcard you can talk or just listen to your ham friends without having access to a radio.

Internet linking will work on a 56k-dialup modem but a high-speed connection is best.

Repeaters represent a big investment in both time and money and the aim of the Internet radio-linking project is to increase activity on repeaters and simplex channels.

Using IPHONE 4.5 one of the memorable QSOs G3ZHI had was with the Motorola Museum club station in Chicago USA K9MOT. While talking to K9MOT over the N9EP-R repeater, a radio amateur passenger in a light aircraft joined the QSO, working aeronautical mobile (which is permitted in the USA). Just at that time the aircraft was flying above the Museum and the radio amateur in the plane was sending live video to the club, they then forwarded it via the IPHONE program, so G3ZHI was able to see the video from the plane.

G3ZHI has also worked another radio amateur passenger in a light aircraft, this time while out cycling and using a hand-held on GB3DV, the 70cm repeater in Maltby, which was connected to N9EP-R in Chicago via IRLP.

A U.K. repeater system could be developed providing full coverage of each Motorway . e.g. The M1 motorway could have several repeaters all linked together providing continuous coverage from London to Leeds.

Check http://www.dcc.rsgb.org/ShowGates.asp?call=ALL to see if you have a local gateway near you. If you live within 10 miles of a gateway you should be able to hear it when it is active. They are not all 24 x 7 and you may need to contact the keeper to check when the link is available.

You can listen on line to the Californian Winsystem 24 hours a day by following the link on their web site at http://www.winsystem.org

There are a number of 'egroups' on http://groups.yahoo.com which have discussions about Internet linking which you can join.

For sites on repeater Internet linking search using http://www.google.com

To use the Internet linking programs on a computer it must have a microphone, soundcard and speakers fitted. It is a good idea to first test that your microphone and soundcard are working correctly by using the sound recorder program located in Windows Accessories.

IPHONE (5Mb download)

IPHONE has been used for ham radio linking since about 1996 and offers audio and video.

After downloading, the first chat room you connect to is the default 'General' room which can be deleted.

You need to join the 'ham radio' private chat room. To do this first click on the drop down menu 'Chat Room' on the 'Global On Line Directory' then click on 'New/Private' type in 'ham radio' - all lower case then click 'join'. You will then see a list of all the ham stations in the room. Click on a callsign to call the station, which could either be an individual, who is using a computer, a repeater, or a simplex link. Non-hams can also use the program enabling SWL's to talk to hams, this is fine provided there is no radio link involved.

You can link a transceiver to the Internet with the IPHONE program by using a VOX unit to operate the TX/RX function. Ready built VOX units are available from CPC http://www.cpc.co.uk part number HK00035 priced £16 pounds.

Vocaltec no longer sell the IPHONE program and therefore they will not allow you to register it. However it can be uninstalled and reinstalled, as many times as you wish (it only takes a couple of minutes) on 7-day free trial basis.

IPHONE also has a 'white board' facility that allows you to exchange text, photos and diagrams with the person you are talking to.

Unfortunately, if you are on a hand-

held which is connected to the Internet via iphone, you have no way of knowing who has joined or left the room. Therefore you are not able to call stations, you must rely on hams that join the room, who are using their computer and can see the list, calling you. When hams click on your callsign and call on your link their audio triggers your VOX unit and puts your transceiver into transmit, when they stop transmitting your transceiver returns to receive and the transceivers audio is passed straight on to Internet. So when you transmit they hear your audio.

IPHONE used to support conference rooms but the facility is no longer available.

IPHONE provides little security so links need to be monitored when the program is being used.

iLINK (300k download) http://www.aacnet.net/

Developed by Graham Barnes M0CSH in 2001.

There are two iLINK program downloads one is for a PC user and the other is for someone providing a gateway and the iLINK interface board.

iLINK users can chat computer to computer, computer to radio, or radio to radio..

Before you can connect to iLINK you have to apply to the administrator for authorisation. To obtain this you have to provide a callsign and a password of your choice. Once your details are verified authorisation is granted but it can be removed at anytime, if there was a need to do so and you would be unable to connect to the server.

If you wish to link your computer to your radio you require an iLINK interface board which costs £25. Around 10,000 hams around the world have so far download the iLINK program. There can be between 100 to 300 users on the iLINK list at any one time.

After installation when you run the program you are presented with a box. Click on BEGIN and a list of stations will appear. You can then call any station on the list or a station could call you. The station you call could be a ham sat at his or her computer using a headset, a repeater or a simplex radio link. There are also several different conference rooms and all stations in the room are able to hear each other.

When you have finished your QSO 'click' on 'END' which disconnects.

There is no SWL listen facility, you must be a licensed ham to download and use the program.

Each station is given a unique number and using DTMF on a radio you can call an individual station. However, when you are mobile and not able to see the list of stations connected on a computer screen, you do not know who is on line as stations come and go at random although some are on line 24 x7. You have to use your experience to gauge which stations are likely to be on line at any particular time.

You can dial '00' that will connect randomly to any station that is on line at that time or '02' connects you to any free conference server. '#' disconnects. '0' checks the on air node status.

For those using computers there is also a text chat facility which is very useful if you are having audio problems or don't have a microphone.

The audio quality is very good and the servers are very reliable.

To transmit you press the space bar once and then press it again to listen.

There is an 'info text' file, which you can edit, when someone connects to you the information is displayed on his or her computer.

eQSO (400k download) http://www.eqso.net/

Developed by M0ZPD in 2001.

The eQSO program can be downloaded from the above web site and installation is straightforward.

When you join a server everyone in the room you select can all hear each other. You can change servers or change rooms on that server.

You can view the full list of all servers and rooms and who is in them.

eQSO can be installed on any computer, including a laptop, anywhere in the world, to have QSOs with fellow hams.

SWL stations are welcome to listen and should identify that they are SWL's. They must not speak unless they are in an SWL only room, which is off air and has no radio attached.

There are three levels of security in place and people can be 'kicked' 'banned' or 'muted' by controlling stations that are monitoring 24x7.

Hams over the world are using eQSO and some are in very remote areas, part of the fun is you never know who you will find on the system. Recently hams in China have started to use the program and I have worked quite a number of them. One Chinese ham has just installed the first RF 70cm Internet gateway in China.

Internet Radio Linking Project http://www.irlp.net

Developed by Dave Cameron VE7LTD in 1977

http://www.ve7ubc.ampr.org/dcameron/dchome.htm

IRLP is primarily a worldwide Internet linked repeater network with over 400 repeaters connected together 24x7. The number grows almost daily.

It is a totally secure system running under Linux Redhat 6.2 (not later versions) and you cannot speak on the IRLP system from a computer, which is connected, to the Internet, like you can using the Windows programs. IRLP was designed just to link repeaters around the world although there are a few links that are on simplex channels.

You call a repeater by using DTMF tones and there is a directory list of all repeaters giving their individual 3-digit number. You use the number to connect and disconnect from the repeater you wish to call, adding a control digit '0' to turn a link 'on' and a '1' to turn a link 'off'.

e.g. To call VK2RBM in Sydney you would tune your radio to a local Internet linked gateway frequency and then dial 6000 to turn the link 'on' and 6001 to turn the link 'off'. You will hear a voice announcement identifying which repeater you are connected to. When you disconnect you get another voice announcement saying 'you are now disconnected' again identifying the repeater you have left.

You can use a 'touch tone' DTMF microphone costing about £50 or buy a DTMF keypad costing £2.50 inc. P&P available from UKIRLP.

You can call individual repeaters or connect to a Reflector, this is a 'conference room' which can have as many as 30 repeaters in the room. Anyone speaking on any one of the repeaters can be heard by all the other repeaters so it is vital that no CW indents or courtesy tones pass from a repeater on to the Internet as it would cause problems.

To connect your repeater to the IRLP network requires an IRLP interface board costing 60 USD plus 15 USD carriage making . To order an IRLP board please visit http://www.irlp.net/

UKIRLP (United Kingdom Internet Radio Linking Project) will help anyone unfamiliar with Linux to install the hardware and software.

You can view the 'live' status page of all the repeaters on the system by visiting http://status.irlp.net

Dialup connections can be used for IRLP and Linux will automatically reconnect if you are disconnected abruptly or if you get disconnected after every 2 hours. However, if you are using a dialup connection you are not able to connect to reflectors, so a high-speed connection is the best option.

Some repeaters connected to IRLP are connected to multiple linked systems e.g. the Winsystem in California which has 17 repeaters linked together and the New Zealand National System which has 19.

You can listen to the 'live' audio on reflector 2

http://www.live365.com/stations/253404

and on the Winsystem http://www.winsystem.org

For more information on Internet radio linking please contact the UKIRLP group or visit the web site http://www.qsl.net/g3zhi/ukirlp.htm

ar

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Ham Radio Today
G3ZHI February 2000
Radio Active
G3ZHI January 2000

Useful URLs

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http://www.qsl.net/g3zhi

UKIRLP
http://www.qsl.net/g3zhi/ukIRLP.htm

Radiocommunications Agency
http://www.radio.gov.uk/topics/amateur/document/linking.htm

RSGB Data Communications Committee
http://www.dcc.rsgb.org/

RSGB list of all simplex UK Internet gateways
http://www.dcc.rsgb.org/ShowGates.asp?call=ALL

RSGB Repeater Management Committee
http://www.coldal.org.uk/rmc.htm

RSGB Guidelines on Internet linking
http://www.rsgb.org/extra/intlinks.htm

Yahoo egroups
http://groups.yahoo.com/

iLINK links
http://www.aacnet.net

IRLP
http://www.irlp.net
VK2JTP iLINK FAQ
http://www.qsl.net/vk2jtp

eQSO
http://www.eqso.net
eQSO FAQ
http://www.2e1ehm.freeserve.co.uk/

Photographs

VOX unit
I R L P board
iLINK a board
Diagram of a set up
D T M F keypad
Screen shots
Iphone
ILINK
eQSO
Winsystem map
New Zealand National System map
NoV Application form

Lists

UK repeaters with repeater linking on them
IRLP world-wide repeaters
All UK Internet simplex gateways

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Ernie Hocking, President
Amateur Radio April 2002

How to join WIA

- **Through your local amateur radio club**
- **Through your Division (contact details on page 56)**
- **Contact WIA Federal Office (03) 9528 5962**

Helping a yacht in difficulty

By Jim Linton VK3PC

Imagine you are in a QSO or just tuning around a band and hear a call for help. Would you know what to do as required under your regulatory obligations as a radio amateur?

A recent incident on the 40-metre band is an example of how amateur radio has a continuing role in providing assistance and saving lives at sea. Emergency calls are not confined to the oceans but can come from land too.

On Thursday 4 March this year Bernie Nicholson VK2ABN was chatting with Mike VK2ABT and John VK3ACA on 7070 MHz when Mike alerted him to "a very weak and distorted signal" on frequency.

Bernie asked the station to go ahead and it was Shawn (listed as Stanley S Gordon) KA7MWL on the Ukrainian registered schooner Bat'kivshchyna 'Fatherland' sailing from Wellington to Sydney with a crew of six.

She was located about 190 nautical miles off the south coast of New South Wales with her sails blown out earlier after being lashed by the tail of a cyclone.

Slow progress was being made at about four knots. Concerns were held that fuel would run out before the vessel reached Sydney. The novice sailors on board were very seasick.

Bernie VK2ABN, located at Tuross Lakes between Batesmans Bay and Narooma, established contact with Shawn KA7MWL on 40-metres.

Shawn apparently amazed his fellow crew by the production of an Icom IC-706 transceiver from his personal belongings offering to contact land. Due to a flat battery output power was limited to five watts. The Bat'kivshchyna's satellite communications system had stopped functioning.

After gathering the essential facts, Bernie VK2ABN then telephoned the Rescue Coordination Centre of the Australian Maritime Safety Authority in Canberra.

The Rescue Coordination Centre under the callsign VIC transmitting out of Charleville Queensland tried unsuccessfully to establish direct contact with the schooner on both the maritime frequency of 8176 kHz, and 7070 kHz.

Bernie VK2ABN set a sked with KA7MWL who closed down to conserve his battery. The next day news from the

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On arrival in Sydney on 6 March, Captain Birioukovych announced that the Discover Ukraine Expedition that began in 2001 had come to an end, due mainly to a lack of funds to replace both damaged main sails.

vessel was a lot more optimistic, the rough sea had abated, they had picked up speed to nine knots after restoring one sail and could now make Sydney.

The New South Wales Water Police had been alerted by the Rescue Coordination Centre and sought regular updates via the telephone from Bernie and his wife Rhonda, who likened it to the radio ham skit of the late comic genius Tony Hancock.

The Ukrainian Embassy was also on the telephone to monitor the situation. On board was the Ukrainian builder, owner and captain Dmytro Biriukovich, and crew who paid $US200 a week on a cost sharing basis. They were a Russian, Swiss, German and two Americans.

The Bat'kivshchyna, a 34 metre schooner was on tour to raise awareness of Ukraine (previously part of the disbanded Soviet Union) as an independent European country

Bernie VK2ABN said, "Things eventually turned out OK. It showed once again that amateur radio can play a role in providing assistance during times of emergency."

The former merchant marine sailor who has been a radio amateur since 1967, also remembers a previous occasion in the 1980s when he heard a yacht calling Adelaide Radio on the 27MHz marine band.

Authorities were alerted to that vessel in difficulty in the Great Australian Bight off Ceduna.

With the closure of the Australian Coastal Radio Service on 30 June 2002 after more than 90 years, reliance is now placed on an automatic Global Maritime Distress and Safety System (GMDSS) with frequencies being scanned by a computer looking for emergency or distress tones.

A key part of the licensing requirements for amateur radio stations is knowledge by radio amateurs about the use of the voice calls of "Pan Pan Pan" for an emergency or distress "May Day".

The recent incident off New South Wales involving amateur radio is one of those that occur from time to time around the world. Are you prepared?

ar

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Andy VK3IV

An active receiving loop antenna for 1.8 MHz

Drew Diamond VK3XU
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It is an unfortunate fact of radio life that towns and suburbs are increasingly polluted by spurious signals and noise from a host of domestic appliances. Our lowest band, 1.8 MHz, is perhaps the most affected by man-made electrical noise, so bad in some areas as to prevent satisfactory operation on "Top-Band".

One popular and generally effective ploy is to use a loop antenna for receiving. A well-made loop has a relatively deep null running through the axis which, upon careful rotation usually allows the most troublesome noise sources to be placed "in the null", thus leaving the wanted signal substantially unaffected. The curious are pointed to Refs. 1 and 6 for lucid explanations of why this is so.

There are several types of loop; shielded coaxial (square, diamond, triangular and circular), pancake, frame and "loop-stick". Loop-stick antennas, popular in portable broadcast receivers, abstract energy from the magnetic component (H field) of the wave (Refs 1 and 3), and are therefore mainly sensitive to ground-wave signals whose electric field is vertical (H field horizontal). Unfortunately, the indifferent material used in loop-sticks currently available does not provide a coil of sufficient Q and directivity for our purpose.

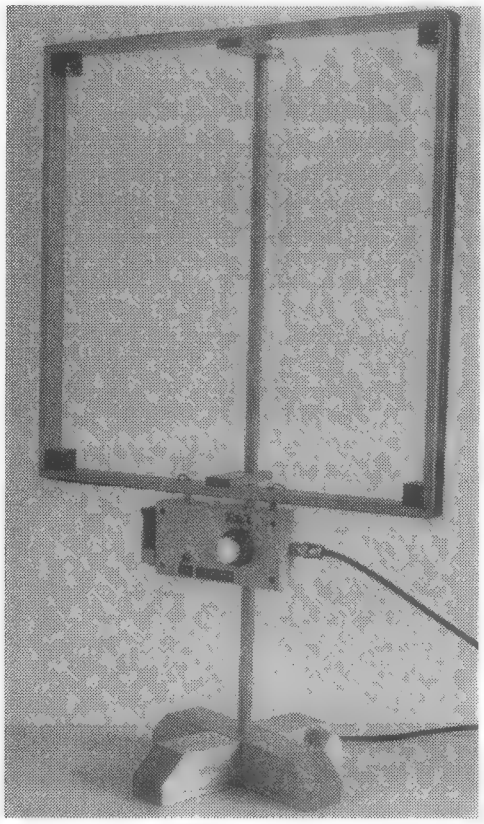

Photo 1 The finished Loop Aerial.

In long-distance work, the wave-front, particularly after ionospheric reflection, may be vertically or horizontally polarized, or it may vary between these two. In order to receive sufficient signal energy, a single-turn shielded coaxial loop made from (say) RG-8 cable must be reasonably large, one or two metres diameter, and a pre-amplifier is still usually required. If the antenna is to be used indoors, such a device is perhaps a little on the large side to be practicable.

Which brings us to the frame loop. According to the formulas cited in Refs 1, 2, 4 and 6, received signal energy is proportional to loop area and number of turns. We may therefore use a smaller, more practicable loop (for indoors) if more turns are added. It was found by experiment that 5 turns of #16 B&S copper wire wound upon a timber frame of just 400 x 400 mm yields a high Q inductance of 50 micro-Henries, which may be resonated, or "tuned", with a standard single-gang broadcast capacitor.

The prototype has given outstanding performance when used indoors, even inside my shack, which has a metal roof. DX signals, mainly from North America, have been received under ordinary conditions, which (by switching rapidly between) compare well with those from my main 3/8 wave 160 m inverted-L antenna. Day-time reception of local amateur stations on the loop is as good as, and usually better than the inverted-L. The loop is also sensitive on 3.5 MHz, but with less "directivity".

Circuit

A loop antenna has the classic "figure 8" directional pattern. Perhaps counter-intuitively, maximum response is obtained when the plane of the loop is parallel to that of the direction of wave travel (side-on), whereupon the wave front reaches the two halves of the loop at slightly different times, causing a phase difference between the voltages induced in each half, resulting in a net voltage that acts around the loop.

When the plane of the loop is at right angles to the wave direction, the voltages induced in the two halves of the loop are of equal amplitude and the same phase. Thus being directed around the loop in opposing directions, they cancel each other almost exactly (Refs 2 and 6).

A possibly simpler explanation is that: for a vertically polarized wave whose lines of magnetic flux are horizontal, maximum coupling occurs when the magnetic component of the wave passes through the opening of the loop, thus inducing maximum voltage in the loop.

Because our loop is physically small in terms of wavelength (and therefore obtains less energy from the passing wave), a pre-amplifier of moderate gain is usually necessary to bring the signal, as received on the loop, up to a level that is near equivalent to that obtained from a "full-size" antenna.

In order that the pre-amplifier shall handle strong in-band signals (which

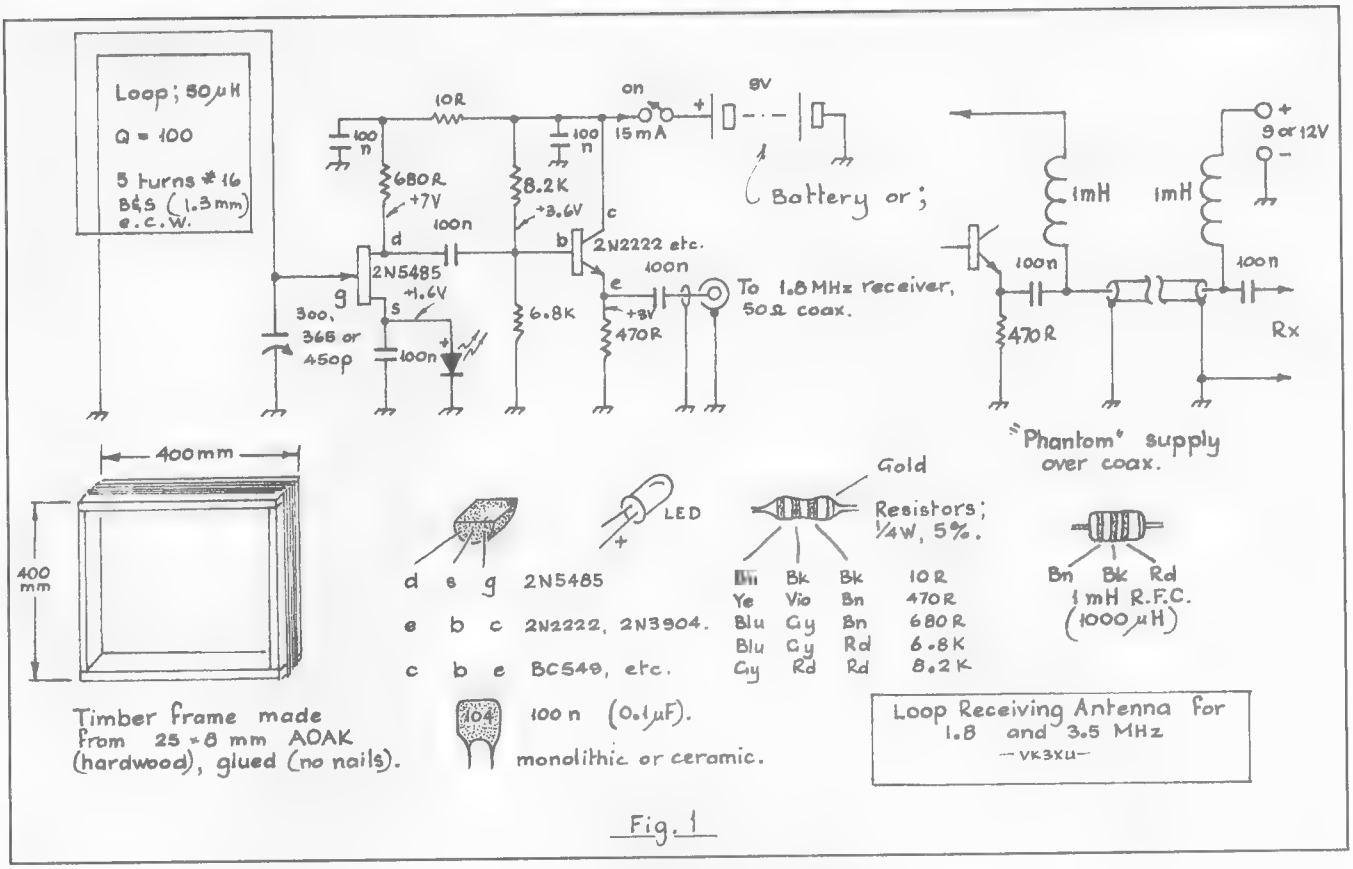

Fig. 1

Figure 1 The Loop Aerial circuit

may be adjacent to a wanted signal for instance), a reasonably high amplifier dynamic range is desired. For an RF amplifier, high dynamic range and low noise are generally mutually exclusive, and so some sort of compromise is generally necessary. Additional noise contributed by the amplifier should not be so great as to mask weak signals, yet, by using moderate levels of bias current for the two stages, will remain substantially un-affected by strong in-band signals.

See Fig 1. The 50 µH loop inductance is tuned to 1.8 MHz (or 3.5 MHz) with a variable capacitor. Signal voltage thus obtained is presented to the high impedance gate of a 2N5485 FET, which provides some gain, but more importantly acts as a high to moderate impedance converter. An LED in the source lead establishes the gate bias at about 1.6 V.

The FET is followed by an ordinary NPN transistor, nominally a 2N2222 biased for class A operation in a conventional emitter follower configuration. The resulting overall voltage gain of the pre-amplifier is slightly greater than one. However, in affecting a high to low impedance conversion, a useful power gain is obtained.

Construction

The amplifier is made using "paddyboard" style construction (Ref 8). A suggested layout is pictured in Fig 2 and Photo 2. But any preferred wiring method, such as 'ugly' or 'dead-bug' may be used provided component leads are reasonably short. The amplifier circuit board and variable capacitor are housed in a "Jiffy" box measuring 130 x 67 x 44 mm.

Any single gang variable capacitor of 300, 365 or 450 pF may serve as loop tuner. That shown in Photo 2 is a ubiquitous MSP 95 + 210 pF part. It is mounted upon a rectangle of circuit board material, which is a slide fit inside the little guide rails of the jiffy box.

The drawing in Fig 2 illustrates a suggested form for the frame, which is made from "square edge Tasoak, 25 x 8 mm" available in 1.8 m lengths from Bunnings. In addition to wood glue, 8 nails were used initially to fix the frame together. To satisfy a curiosity as to any effect that the nails may have on the coil's Q, their heads were left "proud" to ease their removal. Result; Q with

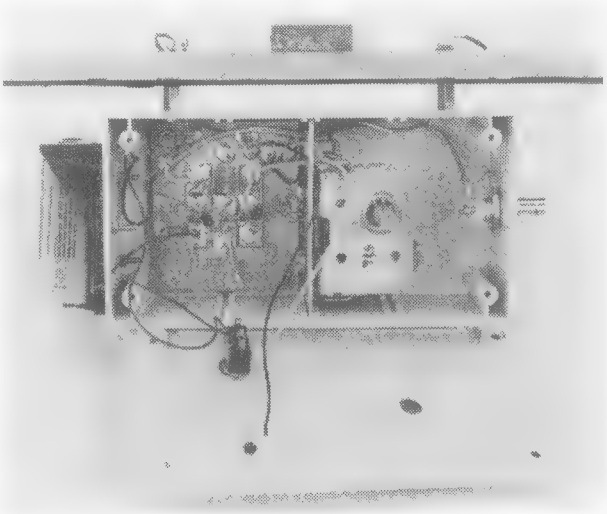

Photo 2 Inside the box.

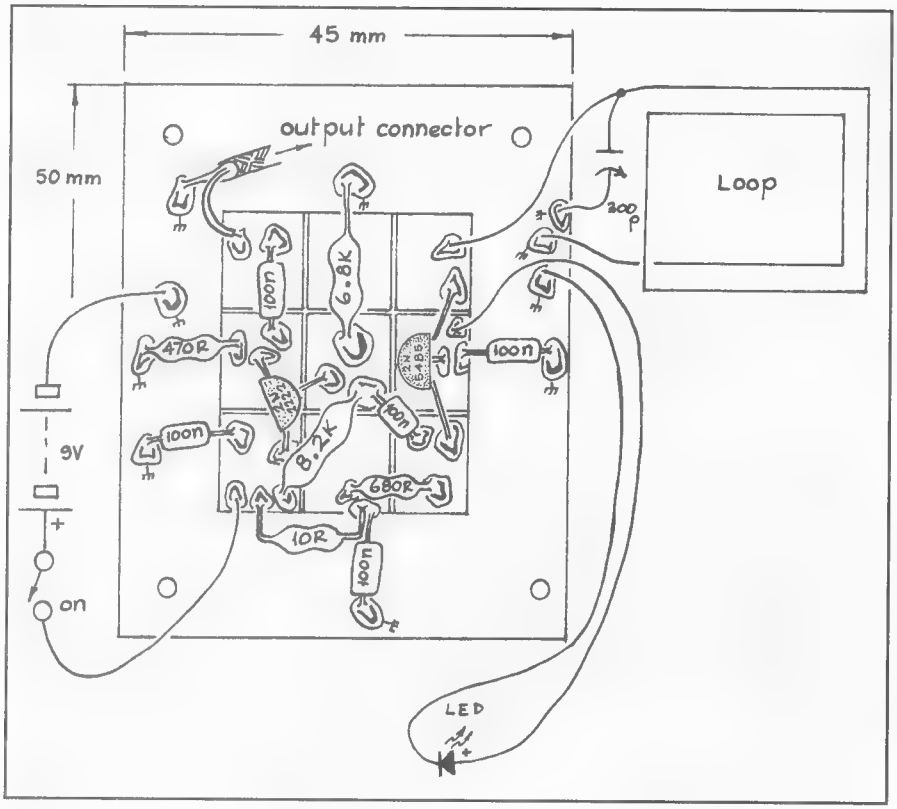

Figure 2 The circuit board.

nails in; 77, nails removed; 100. All-glue fixing is therefore recommended.

Using a triangular file, form 5 evenly spaced notches on each corner of the frame. Two 3 mm threaded hex spacers are ideal for mounting the jiffy box upon the underside of the frame. These also serve as solder-tag points for the loop connections (Photo 2). Wind 5 turns on #16 B&S (1.3 mm) enamelled copper wire onto the frame, ensuring that each turn beds down nicely into the notches (Photo 3).

For easy rotation of the frame, a wood rod may be installed into two wood lugs (Photo 1), which in turn may be fitted into a wood base, or allowed to hang from a convenient sky-hook.

Supply current drawn is about 15 mA, which is a rather heavy drain on an ordinary 9 V "transistor" battery. Depending upon your operating set-up, consider making a "phantom" battery supply circuit along the lines of that shown in Fig. 1, where a regulated 9 or 12 V dc supply would be ideal. The red LED in the source lead of the FET may be mounted in the front panel to serve as "on" indicator.

Operation

Check your wiring accuracy. Pay particular attention to FET and transistor connections. Connect the loop pre-amp output to the receiver's input using any reasonable length of 50 ohm coax. Apply battery supply – the LED should glow.

Carefully adjust the tuning cap for a sharp peak in band noise. Tune your receiver to a troublesome spurious signal (e.g. 1843.750 kHz; 118th harmonic from a local TV line oscillator). You should be able to rotate the loop and place the interfering signal into a pronounced null.

Parts

The electronic components are collectively available from our familiar suppliers, including Altronics, Electronic World and Jaycar. Do not substitute other FET types for the specified 2N5485. The 2N2222 is uncritical. I have a number of the MSP variable capacitors. Please drop me a line (at the address shown above) should you have trouble in locating something for the job.

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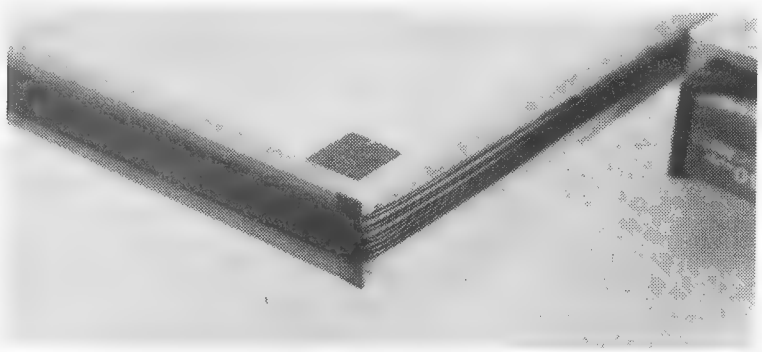

Photo 3 Corner detail

The WIA – in tune with amateur radio

Raft radio

Mike Patterson VK4MIK

With the passing of Thor Heyerdahl many of us were reminded of the adventures of the 6 men on the balsa raft in 1947 or, perhaps, the RA on Rail expeditions in 1969 and 1970. There was a connection to Amateur Radio that played a vital role, some may say life saving, in the three expeditions.

Prior to World War 2 Thor and his wife travelled to Fatuhiva Island where he studied the Polynesian race, saw rock carvings and heard the stories of the Tiki god. This led him to form his theory of the crossing of the Pacific Ocean by people from South America. During WWII he was in the free Norwegian Air Force and later an officer in a special parachute squad working in the Arctic region of Norway.

On the 28 April 1947 the balsa raft Kon-Tiki, 45 feet in length, sailed from Callao with 6 men aboard with the intention of sailing to Polynesia. To provide for communications two experienced radio operators were included, Knut Haugland and Torstein Raaby. They used a sabotage radio transmitter and NC173 receiver. Output power was 6 watt and mode was CW - call sign L1ZB.

Knut Haugland and Torstein had great difficulties with the transmitter at the beginning. After a few hours the crystal broke. A new crystal was put in and the same thing happened until the reserve crystals were all broken. This was a dramatic event. Then they discovered that the crystals broke because of the heat in the box. The lid was too tight giving no cooling for the crystals. To solve this problem, they took a crystal from a military radio set which they carried to communicate with aircraft, and so lost this ability. The most important thing though was to keep the lid open during operation. This worked perfectly and the crystal at 13,990 MHz (see circuit diagram) worked consistently.

Regular contact was maintained with two radio amateurs in Los Angeles - Harold Kempel and Frank Cuevas who took it in turns to listen for signals from Kon-Tiki each night. Information was also passed to the US Weather Bureau.

The Kon-Tiki completed its voyage by grounding Raroia Reef in the Archipel des Tuamotu after 101 days on passage. Knut Haugland is the only crew member still alive and he still takes an interest in the Kon-Tiki Museum in Oslo.

Thor's next major expedition was the RAI and RAII in boats made of reeds from North Africa to the Carribean. This was a further test of Thor's migration theory.

Their radio was a Heath HW-32 and Richard W Ehrhorn W4ETO, general manager at Signal One in St Petersburg FL, carried out its modification to survive the salt air. The panel meter was replaced with a militarized, water and vibration proof unit and the circuit board was water- and fungus-proofed. The VFO was replaced with crystal oscillator and 3 switch selectable frequencies. Cooling fans were installed on both the RF chassis and power supply and everything was mounted in a waterproof fibreglass transit case. A simple 20m coax-fed dipole was supplied, which ultimately was installed as a quarter-wave vertical hanging from RA's mast with the other half horizontal, along the deck as a sort of counter poise. Power was supplied by a small petrol generator.

After RAII failure in 1969 the transceiver was reconditioned but was found to be in good condition. Richard W4ETO handled day to day traffic from RAI and RAII. Chris Bockle LA5KG handled traffic from Thor's Norwegian contacts. The degree of appreciation by Thor Heyerdahl for Richard is shown by Thor's inscription inside Richard's copy of the RA book that reads, "To Dick Ehrhorn, RA's ghost voice."

The call sign LIZB was used by Kon-Tiki, RAI and RAII.

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b) Transmitter diagram from Knut Haugland
c) Correspondence from Richard W. Ehrhorn
d) The KON TIKI Expedition – Thor Heyerdahl Penguin 1964
e) The RA Expeditions – Thor Heyerdahl 1970

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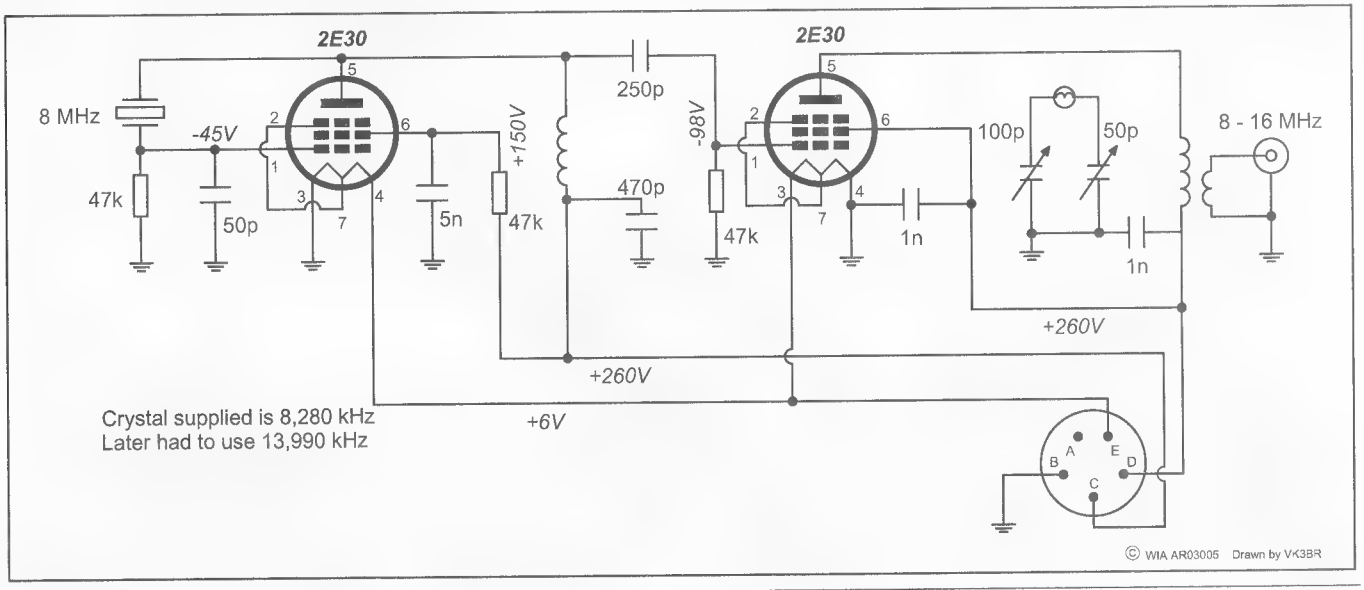


Elementary RF Vector Network Analysis using a HP8410B

Richard Sawday VK5ZLR

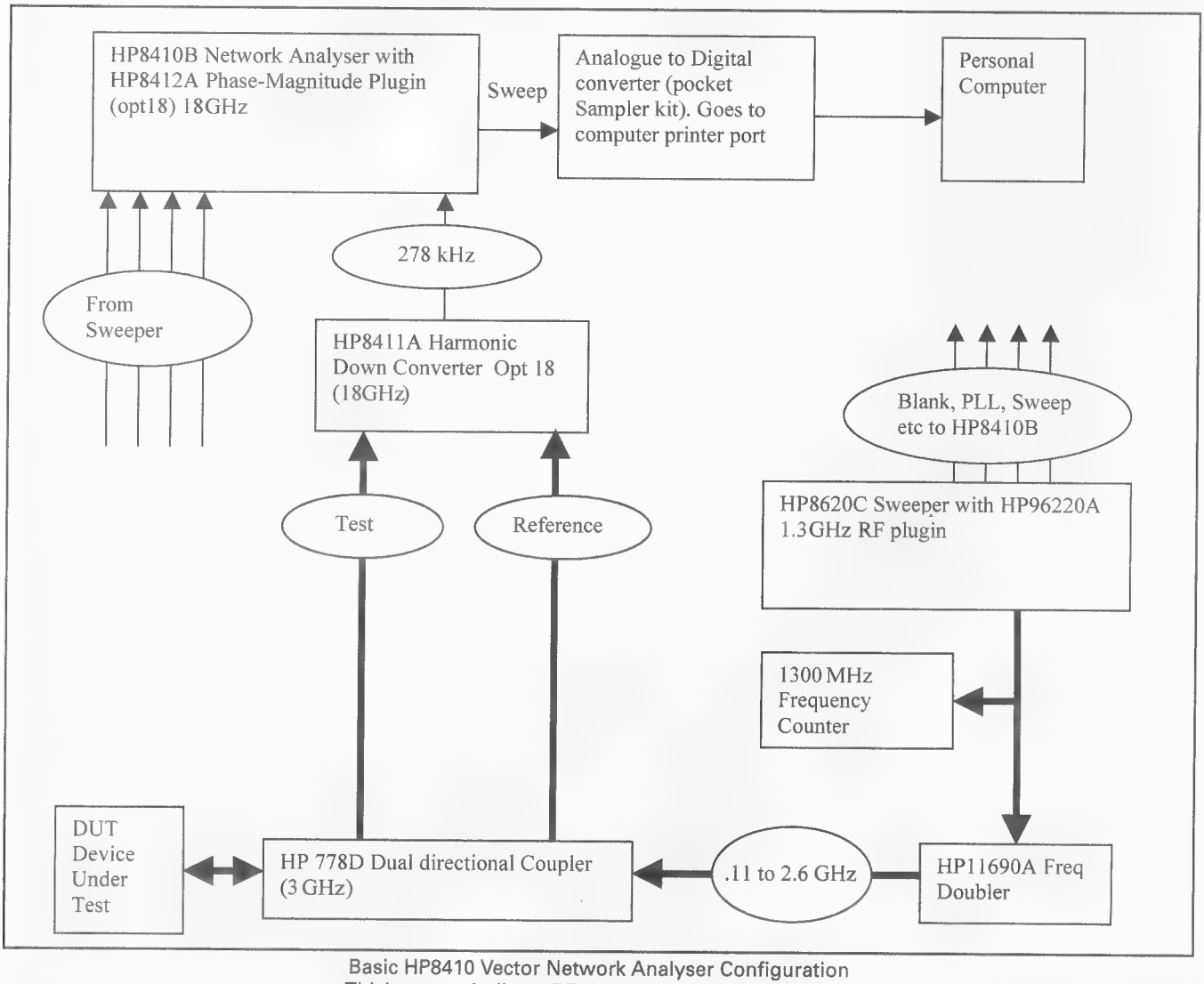
Since HP released their 8410A in 1968, many amateurs have heard of RF Network analysers, few have the opportunity to roll up their sleeves and get in amongst them.

Simply, a Network Analyser compares a known RF signal with an unknown RF signal, so you can for example.

- compare input and output of a transistor,
- compare the forward and reflected power of an antenna,
- compare the loss and phase shift in a coaxial cable with a standard.

The applications to which a network analyser can be applied are limited only by the operator's imagination, from NASA, plotting the radiation pattern of a spacecraft antenna to an amateur, testing a dummy load.

There are two types of RF network analyser, the Vector Network Analyser (VNA), which provides the ability to compare the Phase and Magnitude of two RF signals, and the Scalar Network analyser which allows the comparison of the Magnitude of two RF signals.


HP8410B Network Analyser with HP8412A Phase-Magnitude Plugin (opt18) 18GHz
Sweep
Analogue to Digital converter (pocket Sampler kit). Goes to computer printer port
Personal Computer
278 kHz
From Sweeper
HP8411A Harmonic Down Converter Opt 18 (18GHz)
Blank, PLL, Sweep etc to HP8410B
HP8620C Sweeper with HP96220A 1.3GHz RF plugin
Test
Reference
1300 MHz Frequency Counter
DUT Device Under Test
HP 778D Dual directional Coupler (3 GHz)
.11 to 2.6 GHz
HP11690A Freq Doubler

Basic HP8410 Vector Network Analyser Configuration
Thick arrows indicate RF signal path at test frequency.

Further, more modern VNA's (eg HP8753) are microprocessor controlled with inbuilt signal source, along the lines of plug & play. These are a little expensive for amateurs.

- An Oscilloscope has Time on the X axis and Magnitude on the Y axis.
- A Spectrun Analyser has Frequency on the X axis and Magnitude on the Y axis
- A VNA has frequency on the X axis and Magnitude and/or Phase on the Y axis, also a VNA can display the output as a Smith chart, but we won't go there today.

The diagram below shows a test setup to measure, display, and log to a computer, for future reference and printing, the return loss of a 50 ohm coaxial device between 0.11 and 2.6 GHz. The device could be an antenna, antenna and cable assembly, or as in this example a dummy load.

The key to the test setup is the Sweeper. It is required to provide the swept frequency display on the X axis. The HP8620C has no direct frequency readout so a counter is optionally connected with a tee piece. The signal then goes to the optional doubler, this just extends the range of the sweeper, it's quite lossy but as we are *comparing* levels the exact signal level is not important.

The signal then goes to the directional coupler, where the device under test is connected, the input reference (-20db) and the reflected power (-20db) are both then fed into the harmonic converter. These signals are then *compared* by the 8410B and the results displayed on the screen in the form of a plot, which is strikingly similar to a VSWR plot.

It is in fact a plot of *return loss* from this VSW can be derived by

VSWR = (10^(RL/20) +1)/ (10^(RL/20) -1) where RL =Return Loss

Conveniently the 8412A Phase/ Magnitude display has analogue outputs for both phase and magnitude. If we take the magnitude output and put it into a digital-to-analogue converter (eg Oatleys Pocket Sampler Kit) then into a PC we can log the return loss plot. Then feed this data into Excel, do the manipulations, apply the formula above and hey-presto we have the VSWR plot of the device under test.

For further details email me rsawday@bigpond.com.au

Checkout the website www.rfsup.com.

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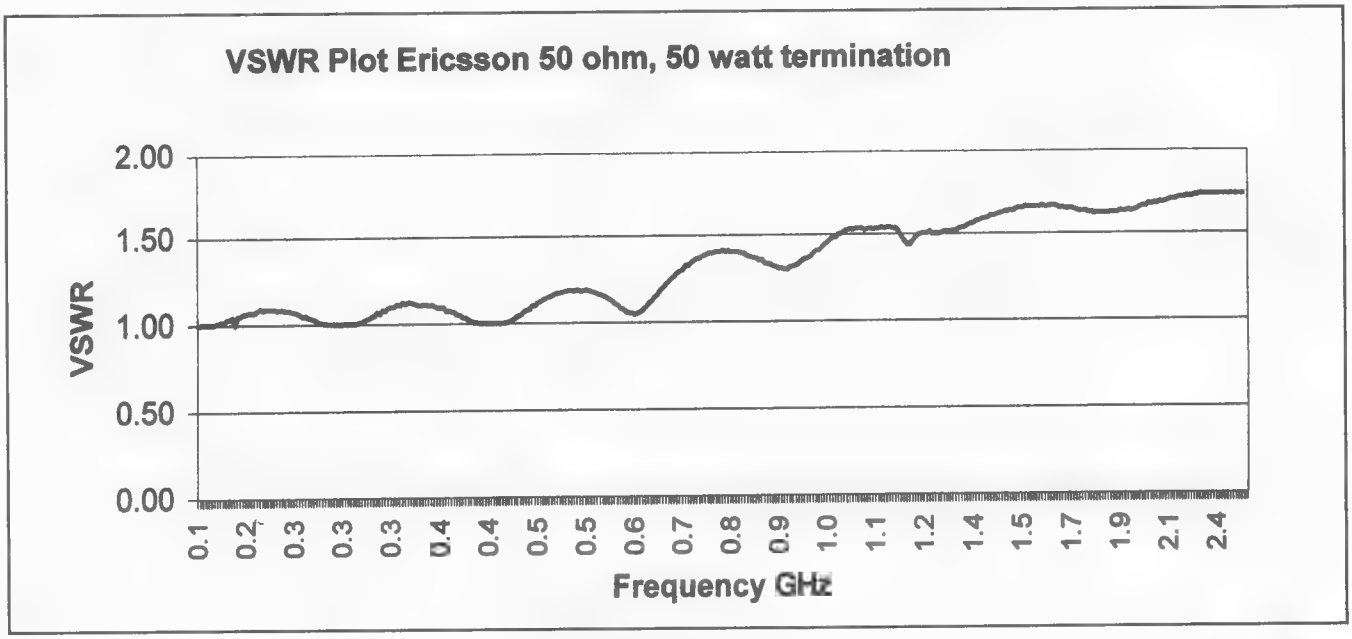

WIA – putting YOUR interests 1st

Club News

Port Macquarie Field Days

On 12, and 13th June, Queens Birthday long weekend the Port Macquarie Field Days are on once again.

Members of the amateur radio fraternity are invited to attend the venue being at the Sea Scout Hall in Bulla Street, on the western side of Kooloonbung Creek next door to the Country Comfort Motor Inn.

Early arrivals may wish to drop in to register and have a social chit chat or a snack comprising of a sausage or steak sandwich and a can of soft drink, tea or coffee.

There will be two practice Fox Hunts in the afternoon and a 2 m talk on Fox Hunts after the evening snack.

Sunday there will be a display by leading suppliers of amateur radio equipment and tables of used amateur radio equipment and other items for sale

Trade Displays, Fox Hunts, Raffles, Disposals, Door Prizes, Prizes for the Best Amateur Radio Vehicle, Barbecue Lunch on the Sunday and Free Tea and Coffee with Fruit Salad and Ice-Cream included in the Registration Fee and Soft Drinks will be on Sale

Registration fee is $10 for men $7 for ladies and $5 for school age children.

Contact details for any queries
Bill Brooke Vk2 ZCW
phone 02 6581 0547.
or email Karen VK2HKW at
vk2uw_vk2hkw@iprimus.com.au
or mobile phone 0413114953

So come and enjoy the beautiful sights of Port Macquarie and mix with the local amateurs of the Oxley Region Amateur Radio Club.

Intruder Watch

Henry VK8HA
Box 619 Humpty Doo, N.T.0836

No reports received of interference from CODAR

Thanks to V.O.A. for fixing their 'straying' Transmitter on 14.075. Much nicer without them there. The RTTY Contest went off in great style without QRM.

The 366 Indonesian Intruders are still interfering on the 14MHz band as well as some 250 intruders from Northern Region 3.

Timor is still very active on 10.1 MHz and looks like we will have them there for some time unless a BIG JAMMER can be found.

The 7 MHz digitals in PY are a continuous nuisance.

Thanks to all observers who keep our Intruderwatch alive.

PS Still big problems with OCTA4-IINET—Telstra??

Cable and Connectors

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- RG58C/U Belden 8259 @ $0.90 per metre
- RG213/U Belden 8267 @ $4.45 per metre
- RG8/U Belden 9913 Low Loss @ $5.15 per metre
- RG8/U Belden 9913F7 High Flex Low Loss @ $5.55 per metre
- RG8/U - RF400 Belden 7810 Low Loss Sweep Tested to 6000MHz @ $6.30 per metre

LINK

- RG58: B80-006 UHF connector (M) @ $7.65 each
- RG8/213: B80-001 UHF connector (M) @ $8.80 each
- RG213: B30-001 N connector (M) @ $9.10 each
- RG8: B30-041 N connector(M) @ $14.00 each

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New Honorary Life Member of the WIA

By Jim Linton VK3PC

A radio amateur who has actively contributed to the WIA and amateur radio generally over three decades, John Martin VK3KWA, has been made Life Member of the Wireless Institute of Australia.

His first active involvement with WIA was when he became a member of the VHF Advisory Committee (VHFAC) in about 1974, which stemmed from his interest in the higher bands since 1968.

Soon after joining the VHFAC he also became a member of the WIA Federal Repeater Committee, mainly to facilitate contact between it and the VHFAC. It enabled him to build up knowledge and an historical perspective that continues to prove valuable to the WIA today.

Coinciding with the merging of the VHFAC into the WIA Federal Technical Advisory Committee (FTAC) in around 1981 he became inactive. Upon early retirement he resumed his involvement and ultimately after a few years inherited the position of FTAC Chairman from Rob Milliken VK1KRM in 1990.

Concurrently he has managed the WIA VHF/UHF Spring and Summer Field Days and the Ross Hull Memorial Trophy, plus adjudicating VHF/UHF/Microwave distance records and maintaining them.

He produced these records dating back to 1947 by searching through Amateur Radio magazine and other references to document the history of this activity.

Disputes over distance record claims or complaints about the running of the field days and the Ross Hull are unknown, due to the excellent stewardship he provides.

John's knowledge has been vital in other WIA activities including since 1990/91 WIA/ACA Liaison, writing of assisting with submissions to the ACA, revision of the Amateur Licence Condition Determinations (LCDs), and other regulatory matters.

John Martin has been involved in the WIA responses to the major issues including planned restoration of the entire 6 m band to the Amateur Service, removal of the 50 cm band, Low Potential Interference Devices (LIPDs), Amateur Internet Linking Systems, Electromagnetic Radiation (EMR) requirements, and the changing amateur access to the 70 cm sub-band 420-430 MHz.

He has been the typical quiet achiever, always working in the background in a highly effective manner.

Attention to detail is a crucial part of his role. Maintenance of the repeater and beacon database on an annual basis has enabled them to be published in the Australian Radio Amateur Callbook, and available to all WIA websites.

A major achievement is gaining the respect of the Technical Advisory Committees in each state, working through issues with them and achieving a consensus. This includes the revision and publishing of 17 band plans.

The annual FTAC Report to the WIA Federal Council is also always informative. He has earned the respect of the amateur fraternity over the past 30 years, and is a most worthy recipient of WIA Honorary Life Membership.

ar

http://www.wia.org.au

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Antenna Manufacturers

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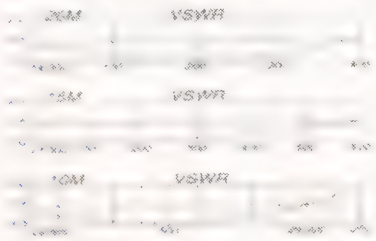

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The EH antenna

Lloyd Butler VK5BR

Out of Balance Current or Longitudinal Mode Current in the Coaxial Cable causes radiation from the coax. But how large a proportion of the total power is radiated or lost from this Current?

A lot has been said about radiation from the coax feeding the EH antenna. This occurs because a longitudinal or common mode current flows when the antenna is directly connected to the cable. There are those who have claimed that radiation from the coax is the primary means by which the EH antenna works. So let's take some measurements and really find out what proportion of the total power might come from the coax.

In this article, I describe how measurements were taken to determine the longitudinal mode current for a given transmitted power at certain points in the coax cable and the resistance component at those points. This enabled me to derive the proportion of power radiated or lost because of this current.

What causes the out-of-balance current in the coax and why does it radiate?

The out-of-balance or longitudinal mode current will occur for any dipole arrangement fed by a coaxial cable without some means of isolating the antenna circuit from the unbalanced transmission feeder.

The result is current (the out of balance result) which can produce a magnetic field along a conductor which runs from the transmitter output to the extremities of the dipole antenna and acts as an antenna itself against ground.

To simulate this as an antenna itself, we have to model a conductor against ground which follows the route of the coaxial cable and ends at the extremities of the antenna.

Figure 1 has been prepared to illustrate how the out of balance currents occur when feeding a balanced antenna from an unbalanced source. The diagram shows a balanced dipole fed via 50 ohm coax cable. Matching elements are not shown and the load presented to the termination of the cable is a resistance of 50 ohm. The cable length, for the purposes of the discussion, is small compared to a wavelength to avoid complicating with varying current distribution due to standing waves. So current along the length of the line is assumed to be constant over the cable length.

At this point, I will also assume no radiation from the cable although the end point is resulting radiation.

I will feed 50 watt down the cable and because the load is 50 ohm, the current is 1 amp. This is shown travelling in the outer conductor in the diagram.

I have assumed a reactance of 500 ohm from each half of the dipole elements to ground for the purposes of the demonstration.

Points B and C are at virtual ground potential and we can assume little current flows via the lower half dipole capacitance to earth. However the upper half dipole capacitance is across A and C and, in effect, is across the 50 ohm dipole load. Since its reactance is 500 ohm, a current will flow of around -j 0.1 amp and this is returned to the transmitter source via earth conduction.

The vector sum of the currents in the three conductors (inner coax, outer coax and earth) must be zero, and hence there is a difference current between the inner and outer conductors of the coax of j 0.1 amp.

Since there is a difference current, there is a magnetic field and the coax can radiate. Of course if there is radiation, there is radiation resistance and the difference current must become more complex than the simple reactive current I have used for the explanation. However I hope the diagram has filled the purpose to explain how radiation from the coax can occur.

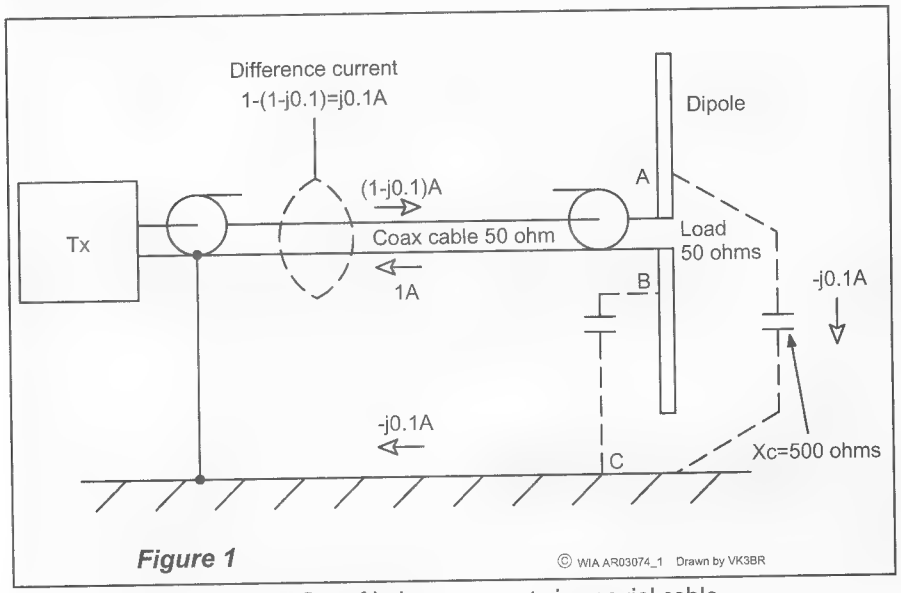

Figure 1 - Out of balance currents in coaxial cable.

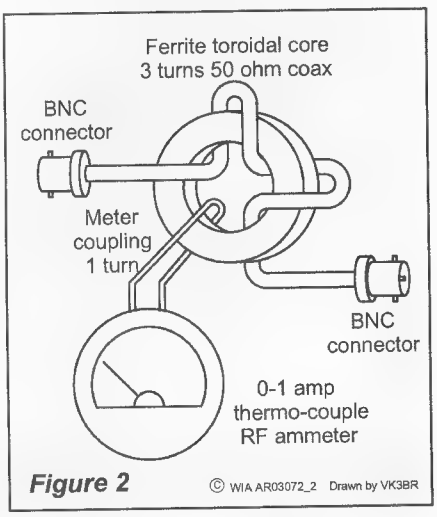

Figure 2 - Longitudinal current measuring device.

Particular case of the EH antenna

In the previous example we depicted a current between a dipole element and ground of 0.1 amp. To do this we needed 500 ohm reactance and for 20 metre, this implies a capacitance to ground of around 20 pF. With such small sized elements, the EH antenna is not likely to exhibit such a a high value. However, the effect is multiplied because of voltage gain in the resonant circuits of the EH matching system.

Take the case of the L+L matched antenna which I described in reference 1. The loaded Q of the matching system is around 7 and hence the voltage across each cylinder to reference ground is seven times that at the unbalanced 50 ohm input of the matching circuit. To achieve a current with this voltage, we only need a capacitive reactance of 500 x 7 = 3500 ohm. This now implies a capacitance of less than 3 pf between the 20 metre EH antenna element and ground to produce 0.1 amp.

The matching circuits of the L+T and Star EH antennas are different (refer Appendix), but voltage multiplication, as referred to earth, between the top dipole element and the 50 ohm input can also be shown.

Of course we can stop the current out-of- balance with the right interface. The purpose of the balun choke or tuned trap in the coax line is to force equalisation of the two currents in the inner and outer conductors so that there is no magnetic field and radiation from the coax line is reduced or eliminated.

But how much power is radiated or lost from the coax when you don't use the interface? First the very short cable.

Short coax cable lengths

For a coax feeder line within the length of 0.15 wavelength, its radiation resistance as a radiator is unlikely to be greater than 10 ohm. In fact not raised fully above the ground it will probably be much less.

Let's look at the possibility of such a feedline radiating. Take the case of 1 amp being fed up the cable differentially into its 50 ohm EH antenna load. Power = I squared x 50 = 50 watt.

Radiation from the coax can only occur from the magnetic field created from the difference current of that of the inner and outer conductors. In making measurements of these currents, the worst case scenario I have seen is when the difference current is around half the current fed to the 50 ohm load. So for the case above, our difference current is 0.5 amp and fed into the radiation resistance of 10 ohm discussed above gives a power of 0.5 squared x 10 = 2.5 watt. This represents a mere 5% of the radiated power of 50 watt.

So you can see that if your feeder cable is within 0.15 wavelength long you are not going to loose much power from feeder radiation. So for these short cable lengths, you do not need a balun choke or trap to reduce feeder radiation loss. In this case, the reasons you might decide to install one is because of too much RF in the shack or you are bugged because of interaction of the antenna tuning with the coax. Whilst these are nuisance things, they will not inhibit your antenna radiating most of the available power in the EH mode at the antenna.

But let's now turn to the longer cable. The antenna height and cable length is the same as I used for the 20 metre air tests described in a previous article. (At time of writing that article, we were describing the longitudinal current as shield current whereas now I am saying the current is due to the out-of-balance between the inner and outer conductor currents).

Demonstration of 10 metre and 40 metre EH Antennas by VK5BR at a meeting of the CW Operators QRP Club (Photo by Don Callow VK5AIL)

Longitudinal current tests

The following describes how measurements were carried out to measure the magnitude of longitudinal current on the coax line feeding several EH antennas operating without a choke balun or line trap. The tests were essentially concerned with the 20 metre antennas to derive information for power measurement. Tests were carried out on a 20 metre L+L matched antenna and a 20 metre Star matched antenna. The currents for a 40 metre L+L matched

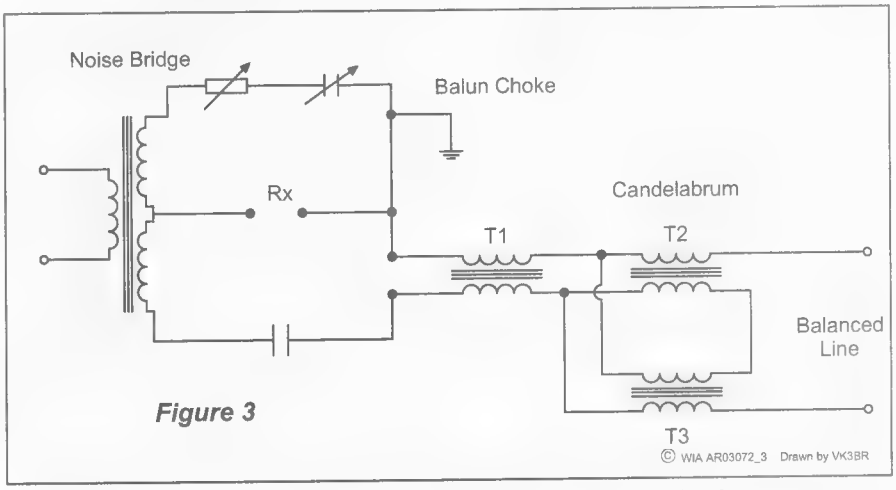

Figure 3

Figure 3 - Candelebra circuit to isolate unbalanced measuring instrument.

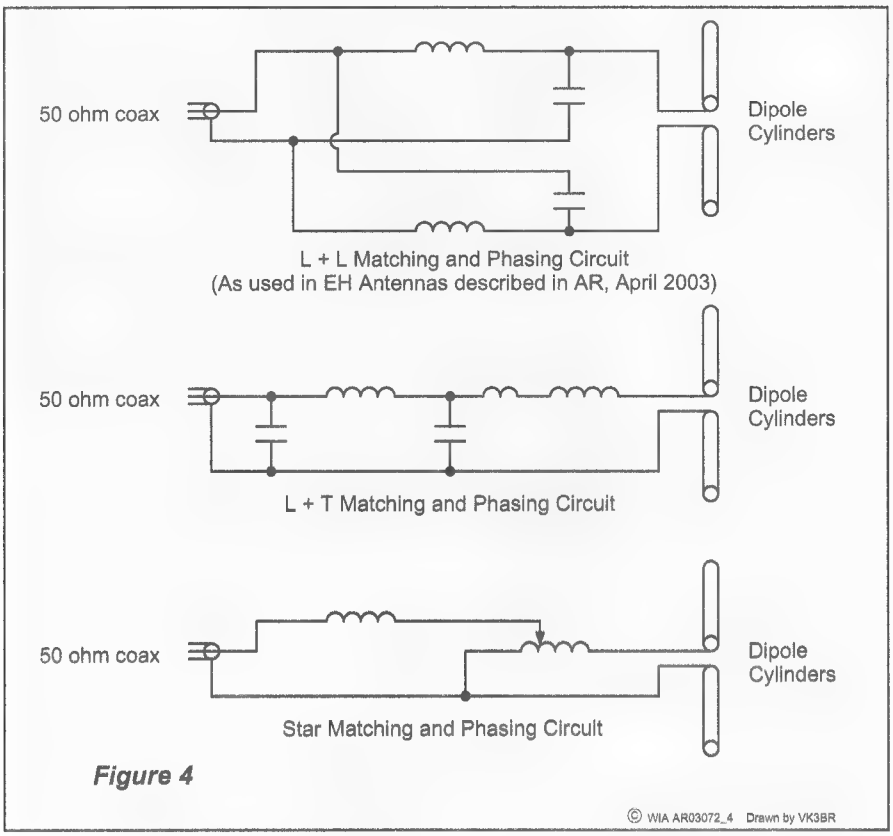
50 ohm coax
Dipole Cylinders
L + L Matching and Phasing Circuit
(As used in EH Antennas described in AR, April 2003)
50 ohm coax
Dipole Cylinders
L + T Matching and Phasing Circuit
50 ohm coax
Dipole Cylinders
Star Matching and Phasing Circuit
Figure 4
© WIA AR03072_4 Drawn by VK3BR

Figure 4 - EH antenna matching and phasing circuits.

antenna were also recorded but not processed further.

Longitudinal current measuring device (Refer Figure 2)

Ferrite Core OD = 40mm
ID = 20mm
Width = 11mm
Ferrite type - Not known

The device was calibrated by connecting to an RF source directly in series with another 0-1 Amp RF ammeter.

Reading = 1.2 x actual current (for 20 metre) & 2.5 x actual current (for 40 metre)

Measurement Results

Antennas fitted approximately 2.5 metre high.

50 ohm cable to antenna - 17.5 metre.

Power fed to antenna - 50 watt.

Calculated differential line current for 50 watt - 1 amp

Longitudinal current measurements taken at:

(1) 1.5 metre from antenna.

(2) At transmitter end.

No choke balun or line trap is fitted for the tests.

L+L Matched 20 metre Antenna
At 1.5 metre - 0.26A
At Transmitter - 0.17A

Star Matched 20 metre Antenna
At 1.5 metre - 0.25A
At Transmitter - 0.2A

L+L Matched 40 metre Antenna
At 1.5 metre - 0.6A
At Transmitter - 0.08A

An interesting result is that despite the fact that the method of developing the two fields in the Star matched 20 metre antenna is quite different to that for the L+L matched 20 metre antenna, they produced similar results of longitudinal current. One might have expected that as only the secondary field of the L+L antenna operates in a longitudinal mode, a different reading might be recorded. The results give support to a theory which has been growing on me that the longitudinal current is more to do with the unbalance caused when you connect any dipole directly with an unbalanced line (without an isolating device to block the common mode currents) rather than due to the specific characteristics of the EH antenna.

Resistance in the longitudinal circuit and the power consumed

Measurement Arrangement

So that power radiated could be derived in the longitudinal mode, the coax was broken at the same points as the previous current measurement to measure the resistance component. The inner and outer conductors of each open coax end were paralleled and measurement was taken between these ends. A noise Bridge was used for the resistance measurement isolated by a series choke and candelabra circuit as shown in Figure 3. The coax break points were connected where "Balanced Line" is shown on the diagram.

Measurements were carried out on the 20 metre L+L antenna with the 17.5 metre coax feeder as described before. Measurements were taken at 1.5 metre down from the antenna and at the transmitter.

Results of Measurements

Resistance measured at 1.5 metre - 104 ohm

Current from previous measurement at 1.5 metre - 0.23 A

Power at 1.5 metre = 0.23 squared x 104 = 5.5 W

Resistance measured at transmitter - 252 ohm

Current from previous measurement at transmitter - 0.15 A

Power at transmitter end = 0.15 squared x 252 = 5.6 W

The previous current measurements were made with 50 watt of power fed from the transmitter. Hence close to 11% of the power is being consumed in the longitudinal circuit.

Summary and conclusions

I have described how a longitudinal current component can occur when you feed a balanced antenna from an unbalanced transmission line such as a coax cable. The phenomenon is dependent on current flowing through capacitance between the antenna elements and ground. In the case of the EH antenna, its elements are physically small, implying low capacitance to ground and low capacitive current. However in offset to this, the capacitive current is amplified by voltage gain in

Robin L. Harwood VK7RH

New period brings changes

The new broadcasting period, which commenced on March 28th, as predicted, had many changes to the bands. Some stations left shortwave altogether, such as WSHB, RTE in Dublin and a major programming reduction of the VOA "News Now" format in English. The VOA has axed programming to the Asia-Pacific region in the morning hours as well as cutting back on releases to Africa and Latin America. I believe further reductions are scheduled at the end of October.

The Americans seem to be increasingly concentrating on targeted broadcasting, particularly to the Middle East, China, North Korea and Indonesia. The various Radio Liberty stations such as Radio Sawa, Radio Farda, Radio Free Asia and Radio Marti all have had their allocations increased, whilst European languages have been reduced or eliminated altogether.

Swiss Radio International (SRI) ended their English language programming on April 12. This means that SRI will continue in French, German and Italian plus Swiss Music filling in the gaps, until it permanently closes down at the end of October.

Deutsche Welle in Bonn has reappeared on 9720 at 2200 in English, beamed to Asia and the Pacific from Germany. Signal strength is very good. This brings News and information from a European perspective. I also can hear Radio Romania from Bucharest in English on 9725 at 2130. The rapid-fire delivery of the announcers coupled with their pronunciation could make comprehension difficult for people using English as a second language.

It is interesting that European signals propagate well at 2200 but they do fluctuate daily. I do expect that European signals will continue past 2300 simultaneously from both the long and short path, particularly on 9 and 11 MHz. Also expect that the higher bands of 15 and 17 MHz will not be as active this winter, as the Sunspot numbers have dramatically declined.

I have also been informed that Radio Slovakia from Bratislava, may be leaving shortwave for the Internet. No date has been announced so far.

Glenn Hauser has announced that he is taking a step back from editing his daily DX and shortwave news via the Internet and instead transferring it to a Yahoogroups list, where observations can be posted in real time.

Bob Padula also has introduced a fee paying private list for members to share loggings and observations. It indeed is time consuming compiling information without getting any assistance with Internet costs.

The BBC World Service may have to do a rethink about local placement of programming via FM, after the Nigerian government banned local station rebroadcasting foreign stations, particularly the BBC. They hurriedly put up additional frequencies for West Africa and it is unclear whether other nations will also follow Nigeria's decision to ban foreign broadcasters being relayed via local transmitters. DW and Radio France International already extensively broadcast locally in Africa. Recently Paris had their programming curtailed in Rwanda, after that nation accused France of complicity in the horrific 1994 genocide.

The only commercial shortwave broadcaster in Japan, Radio Tanpa, from Tokyo, recently changed owners and format. It is now known as Radio Nikkei, concentrating on business and financial information. Radio Nikkei is on 3925, 6055 and 9595. The sender on 3925 is located at Sapporo whilst the others are near Tokyo.

Well that is all for this month. Don't forget you can email your news and comments to me via vk7rh@wia.org.au.

ar

The EH antenna *continued*

the tuned matching circuits of the EH antenna.

For a short coax, the radiation resistance of the coax as a radiator in the longitudinal mode is too low to produce significant radiation. For a longer coax, the power radiated can increase and my tests show such a case where the longitudinal radiation resistance at the transmitter is a high 250 ohm. However multiplied by the current squared at that point, a mere 11% of the power is consumed due to the longitudinal current component.

Radiation from the coax of the EH antenna is a nuisance in that it has the effect of making the antenna tuning adjustment dependent on the length of the coax and its proximity to the antenna. It is also a nuisance because of RF getting into the radio shack. If these things are a worry, then the coax radiation can be easily prevented by using a suitable trap as I have described in a previous article. However my tests show that coax radiation is hardly the primary source of radiation in the EH antenna (as some sources have claimed) and amounts to but a minor proportion of total power radiated.

Other relevant articles in *Amateur Radio* magazine

(1) *EH Antennas for 20 and 40 metre* , Lloyd Butler VK5BR, *Amateur Radio*, April 2003.

(2) *The EH Antenna - More Information on how it works and how it has performed*, Lloyd Butler VK5BR, *Amateur Radio*, Nov. 2003

On the Internet

(1) Refer to articles on the EH Antenna by VK5BR at:
http://www4.tpgi.com.au/users/ldbutler/
Or link from:
http://www.qsl.net/vk5br/

(2) EH Antenna web site:
http://www.eh-antenna.com

Appendix

See Figure 4 - EH antenna matching and phasing circuits.

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Antenna

'HomeBrew'

(with a lot of help from your Bushcomm kit)

SWCS-KIT HF ANTENNA

This is a kit version of our popular SWC-100S single wire model, but you have the great satisfaction of constructing of your antenna.

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Beyond our shores

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Rotarian convention

The ROAR (Rotarians Of Amateur Radio) will be holding their Convention between 22nd May and 26th May at Osaka, Japan. The special call, 8N3RI will be active on all bands during this period. The Chairperson of ROAR-J is Ken Noguchi, JA3LHL.

If you are a Rotarian or ex-Rotarian and interested in this Convention, information can be obtained from rotmem@yahoogroups.com or visit the web site at http://www.2004kansai.jp/

Israel

"Non-Ionizing Radiation"

Israel has proposed legislation on "Non-Ionising Radiation". The information is causing a lot of head-scratching and deliberation on the subject is underway. What can this mean for amateur radio? Will every ham have to have Ministry of the Environment inspectors OK his/her station? Will this cost a lot? Will stringent restrictions be imposed on our hobby?

Since the use of cell-phones has become widespread in 4X Land, there is much concern about the possible dangers of the radiation of these devices held adjacent to the brain, as well as the proliferation of cellular antenna systems on building-tops. Attention is shifting to other transmitting sites, and ham installations are now in the line of fire.

Quite a few years ago, Shalom 4Z4UT of Beer Sheva was taken to court by his neighbours on the grounds that he was subjecting them to dangerous radiation. With documentation provided by the IARC, Shalom won the case. Now the whole topic has resurfaced and in a big way.

(IARC via Q-News)

Hong Kong

Hong Kong to CANCEL ALL existing ham licences.

Hong Kong has announced they will drop the requirement for Amateur Radio applicants to pass a Morse code examination for access to frequencies below 30 MHz say they will also, in conjunction, CANCEL all existing amateur station license classes (and/or authority to operate), replacing them with a new authorisation that does not carry a license class. Hong Kong have also opened the 430 to 440 MHz band for portable and mobiles and allocated 10.45 to 10.5 GHz to the Amateur Service. Changes would "come into effect soon."

(ARRL n/l)

Gibraltar

Gibraltar Amateur Radio Society

Amateur Radio started in Gibraltar shortly after the Second World War. The club organises a number of special events including operating once a year on National Day (September 10th) with the prefix ZG replacing the more familiar ZB.

Thinking of operating in Gibraltar ? Non-residents can obtain a reciprocal call, not a ZB call and may be specifically restricted from operating from some areas of the rock. Maritime Mobile operation with a Gibraltar licence is restricted to operation in Gibraltar waters. Reciprocal licences for visitors are issued free of charge, just contact: THE WIRELESS OFFICER, Gibraltar Regulatory Authority, Europort, Gibraltar. Telephone: + 350 74636. Club meetings are held on Coaling Island and internationals are always warmly welcomed every Tuesday at 20.30 GARS Operates as ZB2LGT

(info@gibradio.net)

Germany – radio science

DF5AI is heading up an Aurora probe and seeks help.

If you have contacted stations using Aurora during your ham career, you are invited to take part in a study on Auroral backscatter. Please submit your QSO data for analysis purposes to Volker Grassmann, DF5AI. Grassmann is heading up a scientific probe of this communications phenomena. He says that he is interested in any and all

Aurora QSOs hams have managed to make from the same geographical position.

Gassman says that the reason for the study is to compare the geographical distribution of DX stations with the theory of Auroral backscatter. He says that analyzing Aurora band openings provides him with a large base of individual observers to provide the needed data. DF5AI has placed a lot more information on his website. If this study interests you take your web browser over to www.df5ai.net to view the details.

(DF5AI)

South America - ham radio adventure

Communicators needed for caving expedition.

Base stations are needed for communication on the ham bands with a scientific expedition. This, in July through August time frame. The 60 day expedition will explore deep caves in the high Andes mountains and jungle in the western Amazon area of South America. Expedition access to the remote areas is via trekking on foot and pack animal. The expedition will use a solar and battery powered 20 watt backpack transceiver. Antennas will be a wire dipole or vertical. A miniature notebook computer will be along for digital operations. Communications will consist of position reports, some short messages with families of expedition members, and any possible emergency or medical messages. All operation will be non-commercial. Operators with good base stations, efficient antennas and low noise locations are needed on the 40 through 15 metre amateur bands. The operations will use SSB, CW and a variety of digital modes. If you are interested, e-mail Bonnie Crystal, KQ6XA, at radioadventure@aol.com

New Zealand

If you happen to be visiting the Land Of Long White Cloud in early June, you may like to attend the Marlborough 2004 NZART Conference, to be held at Marlborough Girls College, McLaughlan Street, Blenheim, during the weekend of 5th & 6th June.

Now Marlborough is sometimes known as the gourmet province, which makes it even more enticing.

This year, the Conference will commence with a brief opening ceremony followed immediately by the AGM. Forum topics, detailed in the last issue of HQIL are virtually finalised and include something for everyone. In Sunday's lineup expect SPAM, AREC, WARO, OTC and AMSAT-ZL.

If you are interested in visiting check out their website: www.zl2ks.com or the Conference Secretary, Helen Harris, ZL2TPT. Email: mt.adde@xtra.co.nz

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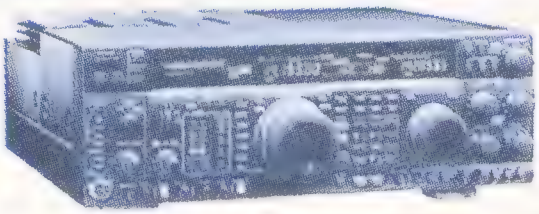

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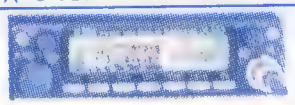

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AR/54

An RF bridge for antenna measurements

Roger Graham VK2AIV

Making a whip antenna? You'll need some way to measure the resonant frequency. Various textbooks suggest coupling a dip oscillator into the antenna via a small loop of wire at the base. If you've ever tried it, you'll agree that it's difficult to do, and gives only approximate answers anyway. Make this small RF bridge, then a little DC amplifier to follow it, and find out how easy it can be. I have used it successfully on 80, 40 and 20 metres.

The bridge circuit isn't original (I adapted it from an article in AR – see Ref.1). And the little DC amplifier which makes it work so well isn't new either (adapted from a circuit in EA – see Ref 2.)

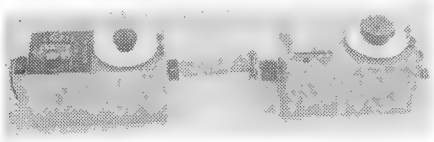

Photo 1 - Dip Oscillator (on the left) injecting RF into the bridge (right)

The idea of course is to connect the antenna, mounted on the vehicle as you intend to use it, directly to the SO239 socket via a short length of coax. Then you feed in some RF from a dip oscillator, coupled into the pickup coil of the bridge. Vary the frequency of the RF, and look for a dip on the meter of the bridge (not the meter on the oscillator).. More about this later.

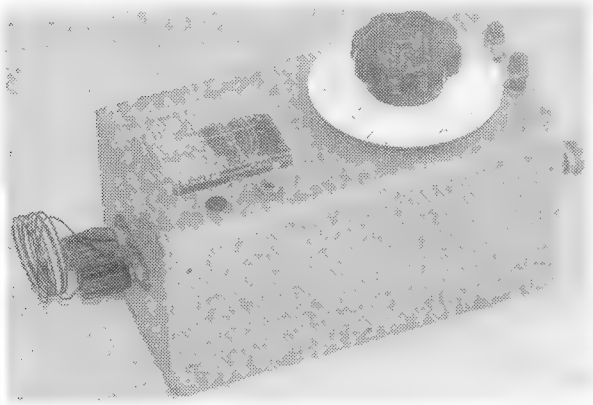

Photo 2 – The RF bridge.

What kind of diode?

I tried quite a number of germanium diodes, and some were much more sensitive than others. The one eventually selected was an ancient point-contact type, glass encapsulated, from a primitive computer board. Be prepared to experiment a bit here.

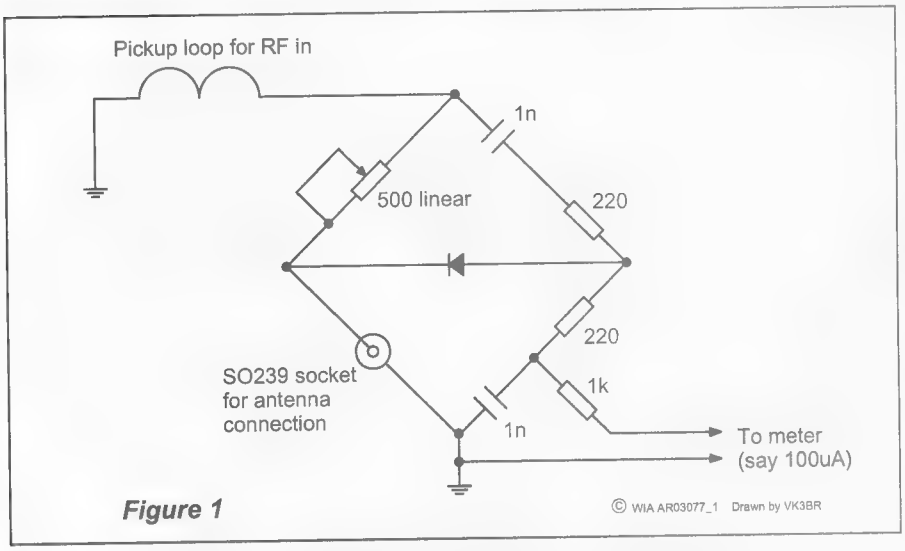

Fig 1 - The basic RF Bridge without the DC amplifier.

The original bridge used a100 micro-amp meter. I made mine using a 60-0-60 uA centre-zero meter salvaged from junk. It worked OK, but the null was rather broad due to the loading effect of the meter. This is where the little DC amplifier (Figure 2) created a magic improvement.

How it works

The small DC voltage from the RF bridge is applied to the inverting and non-inverting inputs of the op amp (pins 2 and 3) via two 10k resistors. The amplified DC voltage out (pin 6) is applied to the meter via a series resistor chosen to give a sensible value of deflection, nearly full scale, when the bridge is unbalanced. In my case, 6.8k was about right for the 60-0-60 uA meter used.

Offset null

The 10k trimpot between pins 1 and 5 is for "offset null". Adjust it so the meter reads zero when there is no input signal.

The battery

The battery is a 9-volt miniature type. In the excitement of tuning up your new antenna you'll forget to switch it off, so add a red LED in series with the positive lead to remind yourself. And it tells you the battery is still OK.

The RF signal

The RF signal to operate the bridge is easily provided by a dip oscillator. I used a pickup loop of 7 turns, about 30 mm diameter, self supporting on short stiff leads held away from the box so the coil of the oscillator could be coupled into it. An RF signal generator could be used instead, or even your transmitter with the wick turned down very low.

Calibrating the ohms scale of the bridge

Put a big generous pointer knob on the 500 ohm linear pot. Mark a scale directly in ohms, from 0 to 500. Either measure the resistance of the pot directly with a good ohm meter, or insert known values of resistor across the bridge at the antenna socket, and simply tune for a dip.

Connecting the bridge to the antenna

You'll have provided a suitable socket on the base of the antenna, probably an SO239 type. And of course, there's a socket of similar type on the RF bridge. Simply join one to the other with a short coax lead with a plug on each end, and you can take measurements right at the base of the antenna. Switch on both the dip oscillator and the bridge. Couple some RF from the dip oscillator into the pickup loop of the bridge.

Vary the frequency by adjusting the dip oscillator. Look for a dip on the meter attached to the bridge (not the one on the oscillator). When you've found a dip, adjust the 500 ohm pot on the bridge for the deepest dip. This, we hope, will tell something about the impedance of the antenna. You'll probably be aiming for a nice sharp dip at a frequency in the middle of the band, with about 50 ohms impedance. Later, when it's all tuned up and the antenna is up in the air, join on a longer length of coax and take measurements from further away. Always keep the operator's body well clear of the field around the antenna to avoid erratic results.

PC Boards

I made mine in two parts, because that's how the project grew. The RF bridge is on a little board (Figure 3) supported by soldering directly onto the lugs of the 500 ohm pot. The DC amplifier, added

Continued on page 27

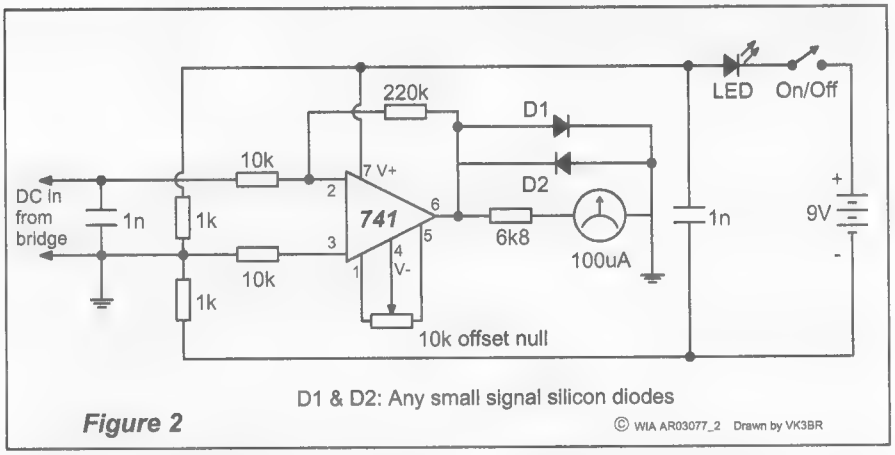

Figure 2

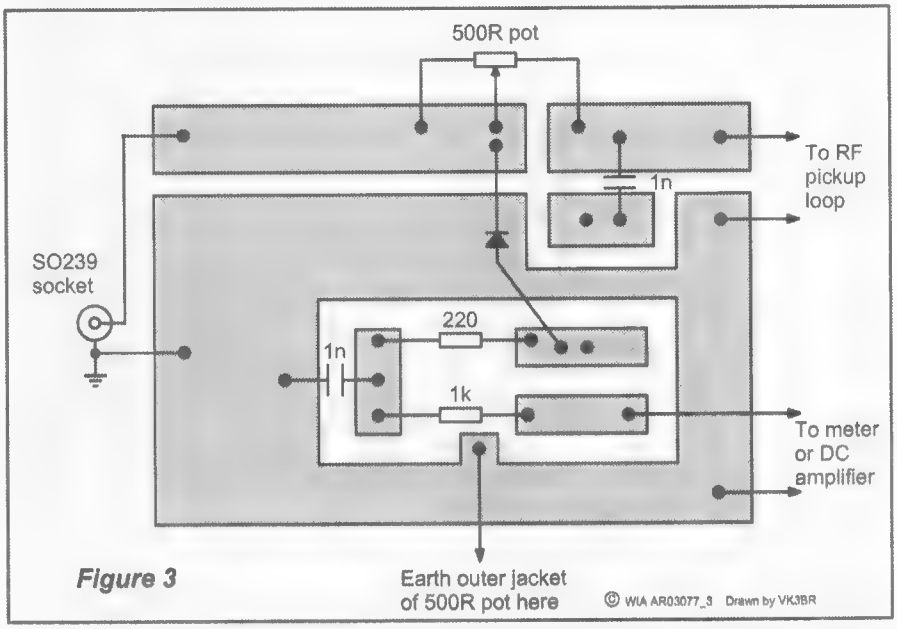

Figure 3

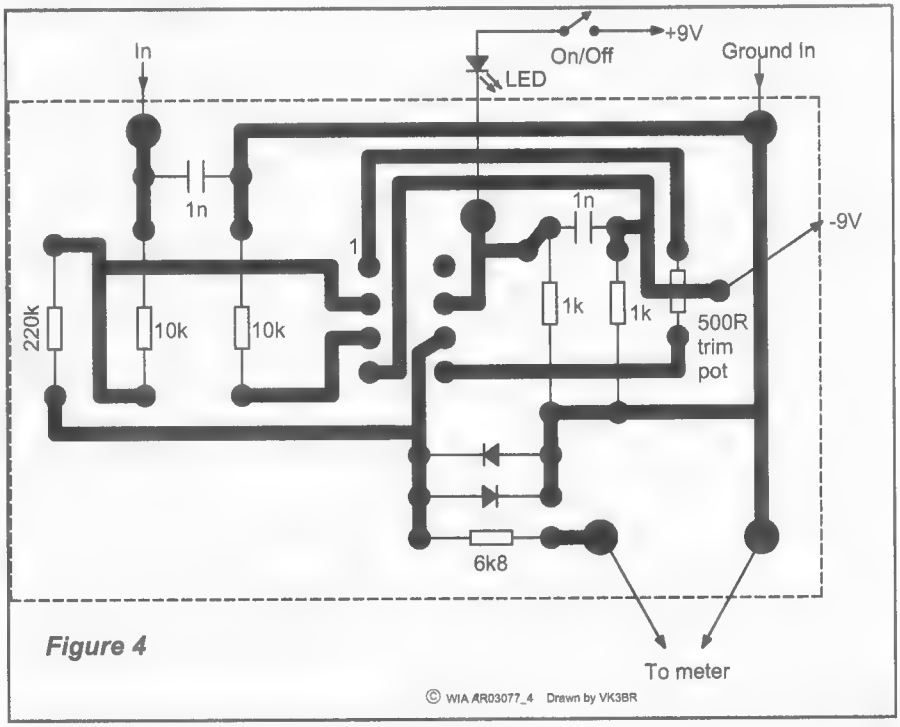

Figure 4

Fig 2 – DC amplifier for RF bridge.

Fig 3 - PC board for the RF bridge, to be mounted on the rear of the 500 ohm linear pot. Components are 'surface mounted' on the copper side of the board. Full size is approximately 55 x 35 mm..

Fig 4 - PC board layout for the DC Amplifier. This view is from the component side of the board.

Chip off the old block

By Jim Linton VK3PC

The prestigious WIA Ron Wilkinson Achievement Award has been awarded to a most worthy recipient, Rex Leonard Moncur VK7MO in recognition of outstanding achievements in the field of digital weak signal working on the VHF, UHF and microwave bands.

Rex Moncur VK7MO

The WIA Federal Council bestowed the award that included the citation that Rex "has consistently demonstrated the true spirit of amateur experimentation and imparted his knowledge for the interest of many others."

He is recognised by his peers as the leading exponent in Australia weak of signal digital modes on the higher bands using the WSJT suite of programs. Creator of the software, Joe Taylor K1JT shares that view.

To tell Rex's story it is best to begin with his late father Len Moncur VK3LN who was a pioneering radio amateur from the 1920s, experimented with television in the early 1930s using a flying spot disc and was on the 112 Megacycle band before the war.

He continued experimenting with television using an iconoscope for a number of years from 1948. The VK3LN station in the inner north-western Melbourne suburb of Ascot Vale became a local landmark with a five-element fully spaced 20m beam.

Rex remembers learning from his father. "I use to spend my time at his feet while he was working DX on 20 m. He was into everything and to that extent I've picked it up and run with it."

At the age of 18, Rex became VK3ZHI immediately exploring VHF on 2 m using amplitude modulation (AM), the mode of the day.

After upgrading to an unrestricted licence with the callsign VK3OB he achieved a 70 cm distance record within a month of that band becoming available on 1 January 1964. Pushing the limits of the 1296 MHz bands he notched up another record in 1966. (In recent years he has set a handful of distance records on the higher bands.)

The next phase on Rex's life was working for the Bureau of Meteorology as an engineer developing radiosondes systems, gravitating to Canberra and became a bureaucrat ending up as the Director of the Antarctic Division in Hobart.

Doug McArthur VK3UM, dual winner of the Ron Wilkinson Achievement Award:

Rex VK7MO has come to prominence in the VHF/UHF field and been almost solely responsible for promoting the new digital modes. He has spent considerable time in investigating the pros and cons for these modes and exploiting them to their maximum potential.

Rex has often explained to friends how he retired in 1998 and within months his wife Meryl died. That great loss naturally caused him to think about his future, and remembering the good times he had as a young man enjoying amateur radio.

Speaking with emotion in his voice, Rex said, "All of that youthful enthusiasm I had was still there 40 years later. I really didn't believe I could get back into amateur radio and that it had gone beyond me."

However he had the time and enthusiasm to re-enter the hobby. His passion remained to be VHF and the 2 m band. Being in Hobart put him at a disadvantage with little activity on that band.

Rex's passion for the hobby and particularly the digital modes is unparalleled. His speciality is within the digital area using meteor-scatter and troposcatter modes.

Teaming up with Ian McDonald VK3AXH at Ballarat he explored meteor-scatter propagation using Hellscriber, a soundcard program that enables long distances to be achieved with weak signals.

Lots of fun was had until someone told Rex in 2001: "You're not doing this the right way. I've got a mate that can make a much better program. His mate turned out to be Joe Taylor K1JT."

Rex and Ian quickly replaced Hellscriber with the far superior WSJT FSK441 program for meteor-scatter.

His enthusiasm includes plenty of promotion of weak signal working including presentations at the 2000, 2001, 2002 and 2003 GippsTech technical conference, writing a weekly email Digital DX News, and contributions to the VHF/UHF – An Expanding World column in Amateur Radio magazine.

VK7MO has mounted WSJT DXpeditions to work from more than 60 grid squares.

"My objective has been to demonstrate to people that you can work 2 m at long distances up to 2,000 km at any time they like," he said.

The first DXpedition was to VK8 because VK3s find it very hard to work that call area on the 2 m. That trip resulted in VK7MO/8 making contact on that band with those in Sydney and Melbourne.

Another that occurred earlier in 2003 was to Cape Hauy a remote area on Tasmania's East Coast.

Rex and Eric Ferrier L70150 made two troposcatter (JT44) contacts with VK3, eight contacts on meteor scatter (FSK144) to VK1, 2 & 3 and 40 contacts on 2 m & 70 cm SSB & FM.

Rex's comment after the DXPedition was: "The exercise demonstrated that with the new digital modes one can make regular contacts in poor conditions up to 1600 km on 2 m with a back packed station comprising a small antenna and 60 watt."

Also in 2003 he went to Lord Howe Island as VK9LS with Trevor, VK7TS. The island is around 780 km east of Sydney, working as far away as VK4, VK5 and VK7 on meteor-scatter on 2 m.

Rex comments: "The most unexpected result was the EME (moon bounce) contacts with just a 100 watt and a small yagi. These were fortuitous as while I did not plan it, the period 9-10 May was one of the best possible for EME in 2003."

He said, "Compared to those early days on 2 m in the 1950s, as a young man, getting really excited to make a contact a few suburbs away, this (WSJT) is really amazing."

The enthusiastic and often emotional manner in which Rex goes about being a radio amateur, exemplifies the essence of the amateur radio spirit and an outstanding record of achievement.

An RF bridge for antenna measurements *continued*

Continued from page 25

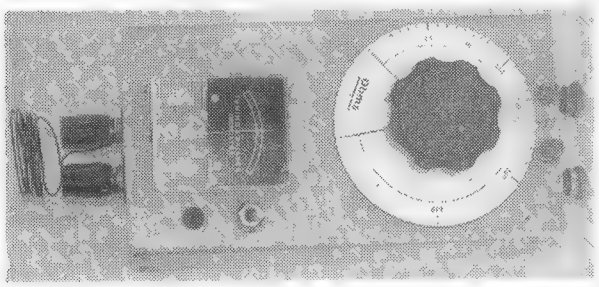

Photo 3 – Another view of the RF bridge.

later, is on a second board (Figure 4) held up on a little bracket inside the metal box. The diagrams show the general idea.

The little PC board for the DC amplifier is made in the conventional way, with components on one side and the copper tracks on the other. Some suggestions are in order here, for a painless way to make such a board.

- Lay out the positions of components on a piece of stiff cardboard, full size, from the component side of the board.
- Mark clearly where holes are to be drilled for component leads, especially for the IC where the pins have to be just so.
- Draw the copper tracks on the cardboard too, as seen from the component side.
- When it all seems OK, trim the card to size and cut a piece of blank PC board to match it. Tape the card onto the PC blank, with the copper side outwards.
- Now drill all the holes, using the accurate layout on the cardboard to get them just in the right place.
- Remove the cardboard, de-burr the holes, polish the copper with steel wool, etc then draw the tracks with a Dalo pen and etch in the usual way. The layout you made on cardboard helps get all the tracks where they should be without mistakes.

Much easier this way, with the holes pre-drilled before laying out the tracks.

References

1. Amateur Radio, September 1965, reprinting an article titled "Antennascope-54" by Wilfred M. Scherer, W2AEF.
2. Electronics Australia, January 1977. Title and author are lost due to repeated copying.

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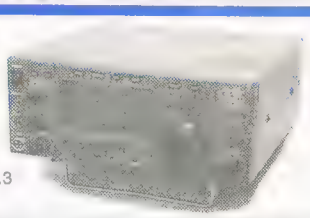

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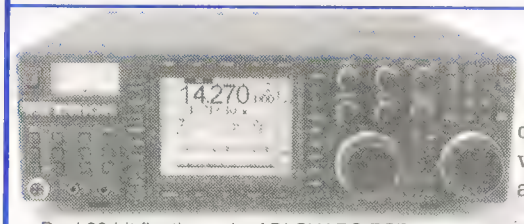

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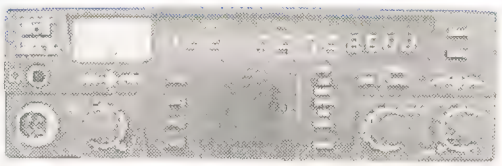
Ten Tec RX350 Communications Receiver

Modes AM/DSB, SAM/LSB, SAM/USB, AM, LSB, USB, CW, DIG, FM
Tunes 100 KHz to 30 MHz,
Stability +/- 90Hz at 25 deg C.
Selectivity 34 inbuilt filters
S Meter S9 calibrated to 50mV standard
Spectrum Sweep Display PC Interface

TEN-TEC 6n2



Model 526 "6N2" multi-mode 6m/2m transceiver. Amateur radios' first IF-DSP multi mode VHF rig. For a long time, there have been no affordable choices for either 6 or 2 meters in a single band VHF multi mode transceiver. Active hams planted the idea with us - why not offer a single rig that has BOTH 6 and 2 meters, without sacrificing performance? Multi-mode HF/VHF rigs have been around for years, at over a thousand dollars and with compromised performance on the VHF bands at best. The 6N2 provides serious multi mode VHF performance in a small, take-anywhere package at a significantly lower price than HF+VHF multi mode transceivers.

TEN-TEC RX340

Professional Communications Receiver

- Modes AM, SAM, LSB, USB, ISB, CW, FM
- Tunes 5 KHz to 30 MHz.
- +/- 1 ppm frequency stability. • User programmable AGC
- Selectivity 57 bandwidths selectable from 0.1 KHz to 16 KHz

- Meter Calibrated in both dBm and S Units • External IF and digital (DSP data) outputs • Both balanced & unbalanced audio outputs
- 100 memories that store frequency, bandwidth, AGC and Mode.
- Remote controllable via serial RS232 port. • Rack Mount, 3U in height. • Power 90 to 264 VAC 30 watts.
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MAC-200

MASTER ANTENNA CONTROLLER (Smartuner Built-In)

The MAC-200 has a Smartuner and an Antenna Switch in one compact unit.
Controls
5 ANTENNAS
3 S0239 COAXIAL CONNECTORS
1 BALANCED ANTENNA OUTPUT
1 END FED LONG WIRE

Displays Forward power on 20 and 200 watt scales and VSWR. Smart enough to do the job without operator attention.
The Mac-200 from SGC is THE answer for feeding multiple antennas from a single transceiver! It's more than a switch, it shares a tuner between all of the antennas. It knows which antenna you're on and remembers the last successful tunes on each antenna so it can get back there fast. All of this works in less than 10ms for frequencies you've been on before, less than 2 seconds for randomly chosen frequencies with a no compromise Pi Network output. The Smartuner remembers everything for quick, perfect matching.
The push of a button makes it work, everything else is automatic. Built in meters for easy monitoring, low power consumption, and rugged construction make it useful for complex field portable operation as well.

"... reports I was given were from 5x5 to 5x9+ on eighty and forty meters QRP. I am told it sounds like 100 watts is being used .. my slogan now is 'the Box that brought my amateur radio hobby back to life'"

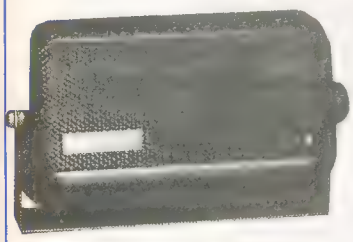
(One of UK's most active low-power amateurs talking about the MAC-200)

Not only but also---
Autek Analysers & Power Meters
Davis Weather Stations
Amidon Cores. Call for a stock/price list
Baluns and Transformers

SG 2020 ADSP²

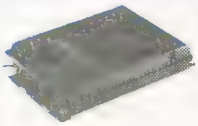
Small, light, rugged, recessed face. Pre-set for 20 watts PEP with front panel power adjustments down to 1W for QRP'ers or up to 20W for serious USB or LSB "hamming". 20 pre-programmed memories preset to each of the 9 worldwide ham bands. Each memory position can be selected for a specific transmitter output power, specific amount of bandwidth filtering, mode and split VFO. Crystal clear.

ADSP2 Speaker



Works with the press of a button. You can select from three modes of operation: no noise reduction, the original ADSP, and the new ADSP2 noise reduction modes which provides up to 26 dB of noise reduction within the passband. The ADSP2 Speaker is "One Touch" simple to

up to 26 dB of noise reduction



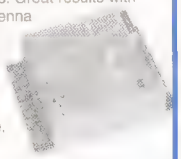
Model SG-230 Smartuner™

Automatic microprocessor antenna coupler. Can be used within its power rating with any HF Transceiver in range of 1.6-30 MHz. Designed for marine, portable and fixed base applications. For antenna types: 23 ft marine whip for 1.6 to 30 MHz and with 9 ft. minimum antenna for 3-30 MHz operation. memory channels: 170 Frequency range: 1.6-30 MHz Power rating: 200 watts PEP maximum: 12VDC. operation

SG-237 HF-VHF SMARTUNER®
Worlds Smallest High Performance Antenna Coupler Finished Product or PCB
100 watts
1.8 to 60 MHz

The SG-239 Smartuner™ antenna coupler

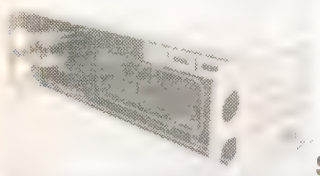
With any transceiver get long distance communications. Great results with a longwire antenna or a coaxial fed multi resonant antenna at the unit window, fits many low cost HF transceivers: Scout, Yaesu FT-817, Kenwood TS-50, Icom IC-706, and the K2 kit. **Ideal with the legendary SG-2020 transmitter.** Silent receiver tuning or within 1.5 to 200 watts with a high power transceiver. 170 memory bins, independent sensors, inc.VSWR, phase. magnitude, low impedance, and forward sensing.



SGC

SG-211 MINI-Smartuner

SGC is announcing a new Mini-Smartuner, with zero power consumption. No DC wiring is necessary to power this Smartuner. It has a naturally balanced output for operation with whips, long wires and dipole antennas



Due for release April

We will have stock end of April

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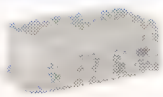
Microprocessor controlled
Switched L tuning network
Continuous coverage 1.8 to 54 MHz
Power rating HF (1.8 to 30 MHz): 1000 Watts Single Side Band 750 Watts CW 500 Watts Digital (RTTY, Packet, etc.) Power rating 6 meters: 100 Watts



RT-11 Autotuner

A feature of the RT-11 is latching relays, which retain their settings so the RT-11 can be powered down once it is tuned. If you shut down after a night of operating, the next morning the tuner is in the same configuration. This power saving feature is very popular with our QRP Z-11 customers. The heart of the RT-11 is a 68HC11 Microprocessor which performs many hundreds of quick tests to determine the correct combination of capacitors and inductors to load your antenna system. Tuning is in 1 to 5 seconds . The tuner can handle 0.1 to 125 watts (100 watts continuous, 50 watts on 6 meters) of RF power.
The water resistant case can be mounted on a tower, in a boat or car, outside the window of your shack, ... almost anywhere. The case has 2 flange mounting brackets to facilitate ease of mounting Since the unit is RF sensing, it will tune when it senses a band change (high SWR), thus it will operate with any HF radio.

See it all on
www.ttssystems.com.au

ALARA

Christine Taylor VK5CTY
vk5cty@vk5cty or geencee@picknowl.com.au

Home for a gift

Remember that donation of a complete radio station given to ALARA by Vic VK2EVK? We have found an ideal home for it, where young people already interested in radio will use it.

Leading up to and during the recent World Scout Jamboree held in VK5 last January the RIG came to be. RIG is the Radio Interest Group. It operates under the umbrella of the Scout movement, which these days includes boys and girls. It is lead by Leanne Adcock. She is supported by Dean VK5ZDW Commissioner for Radio in VK5, her OM Luke VK5KSA, Jeanne VK5JQ, a member of ALARA and her OM Keith VK5OQ, Paul VK5PH and other amateurs, as well as by an enthusiastic groups of parents.

RIG operates from a Scout Hall in a beachside suburb of Adelaide and ran what was described as one of the best ever Radio Stations at the recent Jamboree. Many of the participants in the Jamboree came back several times to the radio shack or stayed for more than just long enough to have their cards stamped!! One girl came almost every day to have a sked with her father (who is an amateur, of course).

It has taken some time to find the right "home" for Vic's station but RIG sounds like exactly the sort of group he had in mind when he donated his station to ALARA. We can expect updates of the activities of the group and the use made of the rig, from time to time, in this column.

WARO and ALARA Awards

For the WARO Award, only 12 WARO licensees need to be contacted on HF (any mode or mixed modes but all from the same QTH) for VK and ZL operators, six HF contacts for other DX operators. If you are in ZL-land you could qualify for the VHF section of the WARO Awards with ten WARO Members contacted on VHF either directly or through repeaters.

There is a section for SWL which requires 20 contacts with WARO members to be heard, listing callings of both stations as well as all other log details.

If you have made contact with 100 WARO members, including DX members from any QTH you have earned a WARO Century Award. The contacts can be on any mode or band, and from any location, including those made through repeaters and during contests and nets,

No QSL cards required, just an extract from your log(s) signed by one other licensed amateur.

To obtain an ALARA Award only ten contacts with ALARA members are needed, any mode or band, as long as at least five States are represented. Log details, not QSL cards, signed by another licensed amateur.

For WARO Awards please contact Lynette ZL1LL QTHR the callbook. For the ALARA Award please contact Jean Shaw via email otterburn@maytel.net.au

An interesting item from "New Scientist"

Way back in the 1770s, there were problems for all sailors who ventured out of sight of land, to identify their longitude with any degree of accuracy. To aid them in this endeavour an almanac was published every year, containing all the data a sailor needed to pinpoint his position – a sort of ready reckoner for longitude.

There were "lunars" which predicted the distance between the moon and the sun and certain stars calculated for each day at specific times at Greenwich i.e. at longitude zero. To navigate with these tables the sailor needed an accurate clock set on Greenwich time and a sextant to measure angles and distances of the stellar objects. For every hour of difference between Greenwich time and the time aboard ship the ship was 15 degrees around the globe from Greenwich.

On his own a sailor could do the calculations if he was very mathematically and astronomically skilled and had at least 4 hours to spare. With the tables it would not take him more than half an hour and needed only very simple calculations.

All the hard slog had already been done by "human computers" employed by the Astronomer Royal, Nevil Maskelyne. One of the people who took on this task for Maskelyne was a John Edwards, a curate with a hobby of telescopes. In fact it was Edwards' wife Mary who did the work. John's name was on the payroll but Mary did most of the computing right from the start.

We do not know if Mary had a particularly enlightened father or if she had brothers whose books she studied, but there is little doubt that she was an able mathematician before she married. For each calculation Mary could have to look up 12 figures in astronomical tables and perform 14 additions or subtractions on the data – then repeat it for every day of a month. It was very boring work but Mary was very accurate and rarely made mistakes.

When, in 1784 John Edwards' passion for telescopes proved fatal (he inhaled a lungfull of arsenic fumes when experimenting with suitable metals for the reflecting surface of his telescope mirror), Mary and the children faced poverty unless the Board of Longitude would officially employ a woman. They did so because she was so good at the task.

In fact Mary Edwards was so quick and so accurate that she was employed and continued to do this work for another

forty years. She could complete a two-month chunk of tables in three weeks which took most other 'human computers' several months to complete.

History continues to show that women have done some extraordinary things behind the scenes. The book from which this information came is "Mary Edwards: Computing for a living in 18th-century England" by Mary Croaken as reviewed in "New Scientist" March 13 2004

QSL cards for those YL DXpeditions

A note from Gwen VK3DYL tells us that the requests for confirmation of contacts for the 2003 (and 2001/2002) DXpeditions to those interesting Pacific Islands is slowing down, so maybe this is the time for you to send your QSL cards to her.

Gwen would rather have the cards now than in a couple of years time, as anyone who has been QSL manager can tell you does happen. So please apply for those special QSL cards NOW.

Mini ALARA gatherings in VK5

At the recent meeting of AHARS there were five or six YLs clustered around Sue Mahony and her spinning wheel, as the photo shows. At the barbecue arranged as feedback to amateurs after the recent Jamboree there were again five or six YLs, members of both ALARA and AHARS. We really should stop meeting like this!!

YLs with Sue at the Buy and Sell Shirley, VK5JSH, Jenny Zeitz, a soon to be member, Meg VK5YG standing and Sue Mahony at the spinning wheel

The President Susan VK7LUV being pinned by Jean Shaw

ALARA YLs really exist!

Recently our President Susan VK7LUV met a real ALARA YL. Jean Shaw, our Awards Manager and her OM were in Tasmania and took time to visit Susan to present her with her "President" badge.

The photo shows Jean pinning on the badge. Jean was the first actual member Susan has met.

New "Dummies" Book

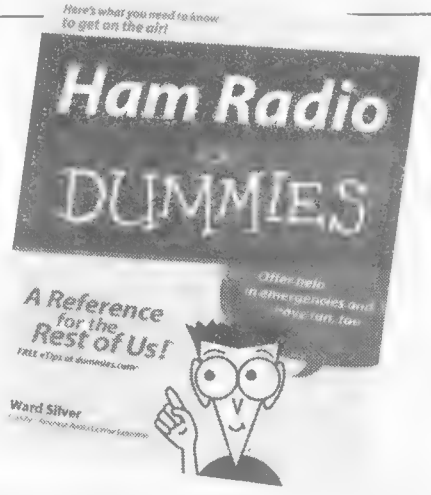
73 Richard VK2SKY

Ham Radio for Dummies

by Ward Silver N0AX

I just spotted an interesting article at http://www.eham.net/articles/8143. It appears that the "... for Dummies" book series has just added a book on Amateur Radio. Don't know when it will be available here though it might be worth a mention in AR.

(Amazon.com has it in their catalogue)



Division News

VK1 News

Forward Bias

Peter Kloppenburg VK1CPK

Leslie A. Moxon, G6XN, silent key!

He died in England on March 3, 2004. He was 95 and among the oldest Amateur Radio operators in the UK. Licensed in 1928, Les was well-known among the amateur community for his writings on antennas, in particular his 1982 book *HF Antennas for All Locations*, now in its second edition. His book set the standard for practical antenna books and is still referred to by amateurs today. His son, David, said that his father grew antennas in the backyard the way others grew plants and shrubs, and a new antenna design was always taking shape. Of his many antenna designs, one was published in QST of July 1952 entitled "Two-element Driven Arrays". And another will appear in April 2004 entitled "A 6 Meter Moxon Antenna". Several other of his articles appeared during the 1970s and 1980s in Ham Radio Magazine.

New licence

A brand new licence has been issued to W. (Bill) Robertson with callsign VK1WPR, who also became a member of the Division recently.

National WIA

During the last general meeting of the ACT Division it was decided by the members present that the WIA transforms itself from a federally based organisation into a National entity. For those of us who like to try a different band with different operating parameters, try 160 metre. To get on top of the topband, log on to the topband reflector at www.contesting.com and make some preparations for the various topband contest. Two popular ones are the trans/Tasman contest on July 18 and the ARRL contest on December 4/5.

Reminders

Trash & Treasure on Sunday, May 16 at noon in the compound of the Parks & Garden Depot, Longerenong St, Farrer. Sellers and buyers welcome.
Another **T & T on Monday, August 23** at 8 pm in the Scout Hall, same address. Next general meeting on Monday, May 24 at 8 pm. Cheers.

VK2 News

Tim Mills VK2ZTM.

Hello there. When these notes were being compiled it was before the AGM and there is little that can be reported until the June notes. The Sunday news sessions at 10 am and 7.30 pm will keep you informed in the meantime. As reported in the April notes, there were only eight nominations received for the nine Council positions. Some arm twisting will no doubt go on for the ninth position. Until any changes are perhaps introduced, the Division has to function on its normal day to day basis. Sydney based assistance is always welcomed.

This month it is planned to hold the Conference of Clubs on Saturday 29th at Parramatta. Next day, Sunday 30th will be the usual Trash and Treasure at Parramatta, followed by the Home Brew meeting. On June 12th and 13th, the long weekend, the Oxley Region ARC at Port Macquarie conduct their annual field day.

VK2WI has just about settled down after the lightning activity in late January. On 70 cm., a new repeater was constructed for 8525, which left 8600 operational. An additional licence has been applied for, for a system on 9900. One of these repeaters will be assigned to the linked network when development reaches Dural. Currently both the 2 metre and 70 cm VK2RSY beacons are off air due to faults and their age. A licence is also being requested for a 6 metre beacon on 50.289 MHz in the CW mode. The slow morse transmissions continue whenever the computer decides to start after a power down. It too is old and an update is planned. The 80 metre transmitter is now running about 30 watt to a low inverted vee dipole. It had a minor fault in that the output power would slowly increase, which was finally too much for the power supply and it kept expiring. A new, matched power supply has corrected the problem. There is still some interest in morse, or at least this transmission, it would appear. Whenever it would go missing, there were calls to the Parramatta office inquiring as to its status. We know that some use is made of the signal as a propagation indicator. The latest lightning induced problem appears to have been with the 30 pair Telstra cable, which is underground on the Dural property. Several circuits developed earth faults due to water. It is in the process of being replaced as we write.

As the winter conditions develop, the Sunday evening news session is providing good coverage in eastern Australia. Often, the 80 metre callbacks equal or exceed the morning 40 metre reports. The AM transmission on 40 metres - 7146 kHz - still has a [almost] clear channel in our time slot. As the evening advances and it gets dark in the Middle East, there is considerable traffic near the channel. Hopefully it stays that way. There are few evening reports on 30 and 20 metre. It would appear that most HF listening at that time is to the 80 and 40 metre transmissions. The 160 metre AM transmitter has been off for a while as tree growth encased the antenna. While the site is extensive, finding a path longer than 80 metres,

clear of trees is proving a challenge for the dipole. It is almost as though trees are attracted to RF. The antenna is a dipole hung as an inverted vee. Poor rocky ground has not helped in considering a vertical system. We would be interested in hearing about or receiving details of easily constructed 160 metre antennas with a ground wave component.

Those readers into constructing antennas and guying masts and needing insulators should check out the rural supply stores that handle electric fencing. Nowadays the range is usually confined to various plastic versions, rather than the older ceramic or porcelain models. The price is usually attractive compared to the more traditional sources at the electronic stores.

Regards - 73, Tim VK2ZTM.

VK3 News

Jim Linton VK3PC
WIA Victoria web site: www.wiavic.org.au
email: wiavic@wiavic.org.au

WIA restructure proposal update

The WIA Federal Convention (AGM) held in Brisbane 2-4 April has provided considerably more detail of an evolving plan to restructure the WIA into a National Body. This was the very first occasion at which the WIA has met to discuss the restructure proposal.

There was concern by the majority of the delegates representing the seven WIA Divisions at the Federal Convention about an implementation agreement. A binding contract requiring two signatures from each WIA Division. This agreement, still in draft form, was only produced during the Federal Convention, following extensive discussion involving all in attendance. It has since undergone further changes.

The WIA Victoria delegates in Brisbane were unable to commit on-the-spot to that agreement or a new constitution for the proposed National Body, due to it only being previously available in various draft forms.

WIA Victoria reaffirmed its commitment to the membership that it would work cooperatively with those seeking a national body. This has occurred before, during and following the Brisbane convention.

The other part of the commitment to members was that the WIA Victoria Council would seek legal and other professional advice on documents provided, and have the members make the final decision about the proposed restructure once all of the relevant material was available. .

In recognition that WIA Victoria is a public company limited by guarantee, its councillors (directors) need to act in accordance with the current WIA Victoria constitution, and Corporations Law.

Michael Owen VK3KI, who is assisting with the key documentation for the proposed restructure, stated at the Federal Convention that control of the VK3 and VK2 assets was required to make a National body viable and give it an appearance of having "substance". He also firmly believes that WIA Victoria and WIA NSW must remain in existence as companies.

WIA Victoria considers that the draft National Constitution provides a basis for discussion. However, in its present form, it does not adequately address the enormous contribution expected from VK3 and VK2 in terms of membership numbers or assets.

WIA Victoria acknowledges the changes introduced so far by Mr. Owen to the draft National Constitution, which are in response to input provided by WIA Victoria.

Further negotiation is needed on the issue of adequate local representation, protection of the membership and assets, which need to be locked into any national constitution and implementation agreement. This requires legal advice to be obtained on the documentation that is now available. The WIA Victoria Council will then call a meeting of members for a decision.

New Honorary Life Member

A radio amateur who has actively contributed to the WIA and amateur radio generally over three decades, John Martin VK3KWA, has been made Life Member of the Wireless Institute of Australia.

His first active involvement with WIA was when he became a member of the VHF Advisory Committee (VHFAC) in about 1974, which stemmed from his interest in the higher bands since 1968.

Soon after joining the VHFAC he also became a member of the WIA Federal Repeater Committee, mainly to facilitate contact between it and the VHFAC. It enabled him to build up knowledge and an historical perspective that continues to prove valuable to the WIA today.

Coinciding with the merging of the VHFAC into the WIA Federal Technical Advisory Committee (FTAC) in around 1981 he became inactive. Upon early retirement he resumed his involvement and ultimately after a few years inherited the position of FTAC Chairman from Rob Milliken VK1KRM in 1990.

Concurrently he has managed the WIA VHF/UHF Spring and Summer Field Days and the Ross Hull Memorial Trophy, plus adjudicating VHF/UHF/Microwave distance records and maintaining them.

He produced these records dating back to 1947 by searching through Amateur Radio magazine and other references to document the history of this activity.

Disputes over distance record claims or complaints about the running of the field days and the Ross Hull are unknown, due to the excellent stewardship he provides.

The knowledge of John has been vital in other WIA activities including since 1990/91 WIA/ACA Liaison, writing or assisting with submissions to the ACA, revision of the Amateur Licence

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dB/m 150 MHz	0.130	0.050
2400 MHz	0.550	0.220
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Connectors		
N-Type	$7.00 ($3.00 *)	$7.00 ($4.00 *)
RPSMA or RGTNC	$10.00 ($5.00 *)	n/a
Pigtails	email	

* = bulk price

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Email: sales@freenet-antennas.com
Tel: +61 (8) 9319 1720

Division News

Condition Determinations (LCDs), and other regulatory matters.

John Martin has been involved in the WIA responses to the major issues including planned restoration of the entire 6m band to the Amateur Service, removal of the 50 cm band, Low Potential Interference Devices (LIPDs), Amateur Internet Linking Systems, Electromagnetic Radiation (EMR) requirements, and the changing amateur access to the 70cm sub-band 420-430 MHz.

He has been the typical quiet achiever, always working in the background in a highly effective manner.

Attention to detail is a crucial part of his role. Maintenance of the repeater and beacon database on an annual basis has enabled them to be published in the Australian Radio Amateur Callbook, and available to all WIA websites.

A major achievement is gaining the respect of the Technical Advisory Committees in each state, working through issues with them and achieving a consensus. This includes the revision and publishing of 17 band plans.

The annual FTAC Report to the WIA Federal Council is also always informative. He has earned the respect of the amateur fraternity over the past 30 years, and is a most worthy recipient of WIA Honorary Life Membership.

Annual General Meeting

WIA Victoria members are reminded of the Annual General Meeting on Wednesday, 26 May.

Formal notification was inserted in the April edition of AR magazine, and posted to members who do not subscribe to the magazine as part of the membership.

See you at the AGM!

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VK6 News

Will McGhie VK6UU
Input to: will2@iinet.net.au_08 9291 7165

Post-Federal WIA Convention 2004

The VK6 WIA council met on the Tuesday after the WIA Federal convention to discuss outcomes of the convention. It was a baptism of fire for the new VK6 Federal Councilor Trevor VK6HTW, as at the very last minute, Neil VK6NE could not accompany Trevor as planned. The main issue at the VK6 Council meeting was the proposed change from a Federal WIA to a National WIA. What this means in simple terms is to do away with one level of the WIA structure, namely the Divisional WIA. It is believed by some that a single National structure would better serve Australian amateurs. No decisions were made about this important proposal but Trevor returned with considerable information and a written structure for the change. It is this structure that was discussed at the April VK6 council meeting and the discussions are on going. Even though the VK6 Division is in favor of change, the detail is complex and will require considerable discussion. VK6 WIA members will be consulted before any decision is made.

A little History

At April's VK6 council meeting Neil, VK6NE read out an email he had received from Mick VK6FP. Mick goes back a long way with Amateur radio (early 60s) and the short bit of history makes for interesting reading. For those who do not know much about VK6 there is a large amount of sparse population and the North West Kimberly region (very top of VK6) is one of the sparsest.

Time: early 70s

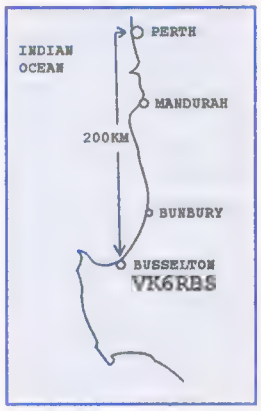
"Charlie Power OIC Derby Radio Telephone Station was easy to get along with. He had his own private aircraft, a two seater Piper, and being an Amateur Radio Ham, VK6CP, we had a lot in common. I used to have regular skeds with Keith VK6KC at Kuri Bay, and Father Basil at Kalumburu, who had a

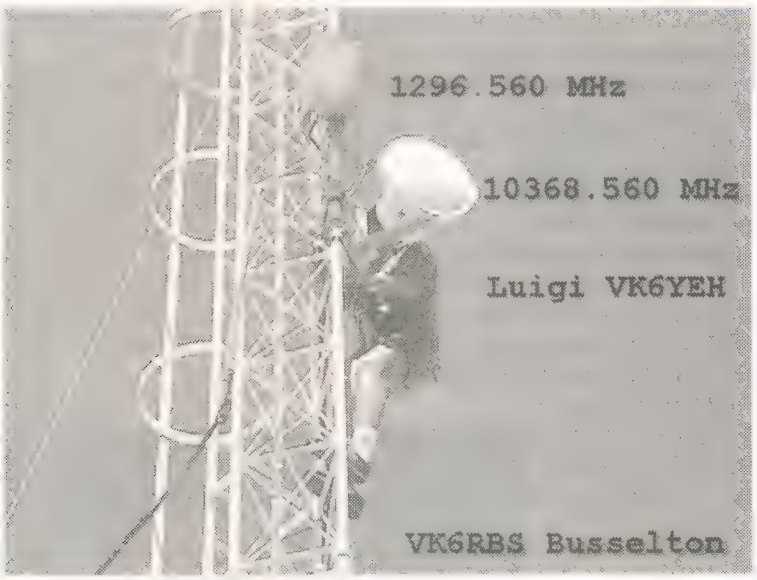
limited call sign, so we could only work cross-band, Father Basil using the Flying Doctor frequency. When Father Basil was ready to sit for his full call, he had to sit for it in Wyndham, the Morse test being conducted by The Postmaster. Charlie and I flew up to Kalumburu in the Piper. I stayed at the Mission to set up a transceiver for Amateur bands, while Charlie and Father Basil went to Wyndham. The Morse test was passed and the results wired through to the Commissioner for Post and Telegraphs, a chap I knew in the Signals Section of my Battalion during the War. A call sign was allocated VK6NA. By the time, they returned to the Mission the Amateur Station was ready for action. We received quite a write up in Amateur Radio Magazine. After returning to Derby, I had regular skeds with Father Basil and Keith on 40 metre."

Mick Paget VK6FP

New 10 GHz beacon

A new (refurbished) 10 GHz directional beacon for VK6 at Busselton, 200 kilometre south of Perth. This beacon constructed by The VHF Group joins a 1296.560 MHz beacon at the same site under the callsign VK6RBS. The 10 GHz beacon is on 10368.560 MHz and was installed by Terry VK6ZLT and Luigi VK6YEH. Both beacons point towards Perth over a largely water path.





Luigi and 10GHz

International YL Meet
October 8 to 11, 2004
in Seoul
YLs, start planning your trip now

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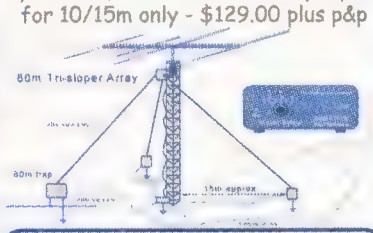
Rippletech Electronics is providing a new service to hams in VK/ZL and the Pacific. Our quarter wave slopers will outperform a quarterwave ground mounted vertical by several dB. You can have access to a DX antenna on 80m and 160m with as little as 15m of ground space (provided you have an existing 15m tower-nally or equivalent). Our best selling combined 40/80m sloper requires even less space. Alternatively, the TZ-V3 and TZV3w will give you access to 10/15/20m or 12/17/30m with a small budget or small backyard. Mount on your metal garage roof for a surprising signal. New novice operators, what about a rotary dipole for 10/15m only - $129.00 plus p&p



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Division News

VK7 News

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au
Divisional Web Site: www.wia.org.au/vk7

Divisional News

The Tasmanian Division Annual General Meeting was held on the 13 March 2004 at the Allenvale TAFE College, Launceston. The Divisional Councillors for 2004 are:

From the North West - Ron Churcher, VK7RN and Steve Jones, VK7ZSJ. From the North - Phil Corby, VK7ZAX, Tony Eagling VK7YBG and Geoff Wells, VK7ZOO and from the South - Reg Emmett, VK7KK, Martin Luther, VK7GN and Dale Barnes, VK7DG.

The Divisional Executive is President, Phil Corby, VK7ZAX and Secretary/ Treasurer, Dale Barnes, VK7DG. Further information about ex-officio office holders can be found on the divisional website.

Congratulations to Rex Moncur, VK7MO who was awarded the prestigious Ron Wilkinson Award at the WIA Federal Convention in Brisbane. The award was for Rex's work in VHF and UHF communications and in pioneering VHF digital communication modes in Australia. Well done Rex, congratulations from all of us in the Division.

Branch Meetings

North

There is a new Northern 6 Metre Repeater now on test on Mt Barrow. The callsign is VK7RAA. Frequencies are receive on 53.875 MHz and transmit on 52.875 MHz FM.

The March meeting was held on the 10th and a record attendance was witnessed with fine cuisine presented by TAFE cafeteria, wines by Sterling Heights vineyard via Geoff, VK7ZOO and a major fundraising raffle sponsored by Sanitarium Aust via Kevin, VK7KVN.

The evening lecture was by Mick Dennis of Australian Customs and covered all facets of our border controls and major drug trafficking detection. The lecture convincingly proved that drug trafficking has no gains with the current technology that Customs use.

South

The Southern 6 metre repeater VK7RAD on the Queen's Domain now has a trial output on 146.850 MHz FM (Ch 5). It is running 60 W into a 6 dB vertical antenna. Please send signal reports to Dave VK7DM or Bob VK7KRW.

At the April meeting held on the 7th it was resolved to open the Domain clubrooms from 7-9pm each Wednesday night for anyone interested in radio and electronics experimentation. This is an invitation to members and non-members to attend.

It was also suggested that the Southern Branch hold business only meetings on one of those Wednesday evenings and leave the other evenings for experimentation and/or presentations, visits, etc.

There were two video presentations after the business meeting that started with a short talk from Rob Gurr, VK5RG, on computer interference to and from radio communications equipment and the second video presentation was given by Geoff Taylor, VK5TY. This talk covered lead/acids, nickel cadmium/ nickel iron batteries, the care, maintenance and dos and don'ts. These presentations were provided by the Adelaide Hills Amateur Radio Society and I express my sincere gratitude to Geoff, VK5TY and the club for being allowed to show them.

PLC/BPL Pilot in Hobart, Tasmania

The main energy authority, Aurora is in the process of implementing a small pilot of Power Line Communication (PLC) by providing broadband Internet to 4 houses and to the 1st and 2nd floors of the Aurora office building. Mitsubishi engineers from Japan have installed the pilot and it will run for two months.

The system uses the DS2 chipset, which uses multiple carriers between about 4 MHz and 20 MHz. Multiple carriers can usually be heard on the 40 and 20 metre band in the form the system is normally configured. The signal should sound like multiple carriers approximately 5 kHz apart as you tune across the band. When the system is idle you will hear a click, click approximately every second. This has already been heard in the Hobart area on the 80 metre band.

Please keep your ear out for BPL/PLC type interference on the HF bands and keep a log of the interference that includes time/date/band/strength, etc.

Targa Tasmania

Targa Tasmania is Australia's premier tarmac rally. This year it runs from 27 April to 2 May 2004 and is staged all around Tasmania. The Southern WICEN group and many other helpers provide the radio communication support during this event. This is a major training experience for this team of highly dedicated enthusiasts. This group is well respected by the event organisers.

Targa Tasmania, providing training and experience for amateurs in portable/mobile operation as well as a great promotional opportunity. Photo courtesy of Roger, VK7XRN.

Over to you

Kenya has made licensing much quicker and easier

I thought you might like to know that our Licensing authority CCK has just dropped the requirement for reciprocal agreements, Police checking and Security vetting. They now want diplomatic relations between the applicant's country and Kenya, but this might be eased if circumstances dictate. CCK will verify all licenses with the originating office by e-mail.

Applicants must complete the new form, which will be on the CCK website (www.cck.go.ke) quite soon, and submit photocopies of the license and passport certified by a Commissioner for Oaths - no other will do. The fee is still K.Shs.3,000, about US$39 at present. Anyone interested can look up details on our website at www.qsl.net/arsk . We are now looking at issues in a few hours or a day or two. A far cry from the five and a half years it took one of ours and the more usual 6 - 18 months! It has been a 14 year battle to achieve this, and the relief is terrific!

You may care to pass the news around - I have told New Zealand, PNG and a number of hams who have asked for help in the past, as well as putting it over the IARU reflector. Maybe QST (ARRL) and RadCom (RSGB) may publish it if they have space!

Morse has also been dropped as a requirement, the rules are being brought up to date and documentation revised.

73 from Nairobi

Ted E.H.M. Alleyne 5Z4NU
Chairman/Secretary ARSK

EchoLink Adelaide

Hi Kingsley,

I have just read your letter, "A bouqet for Echo Link" in April AR and I was quite surprised that you said that there is no Adelaide repeater on echolink, I have been providing the echolink service on VK5RNE for nearly 18 months now, and wonder why you did not see it on the list of stations. The repeater is operated by the North East Radio Club in Adelaide.

The repeater is on every day and the frequency is 439.875, input is 434.875. Node Number 41479. I agree with you it is a wonderful programme The repeater is situated at Ansty's Hill.

I am sorry to read that you have not been too well and had a spell in the hospital.

Wishing you a speedy recovery.

Alan MallaboneVK5KAM.

Ham Advertising

A recent unexpected bonus from the ATO coupled with the new "no Morse code" condition has me shopping for a portable HF/6m rig to complement my VHF set up.

Who would think the money would be so difficult to spend?

I live in an isolated area of NSW, so comparison-shopping is done via the www and magazine(s). So, why is it that so few Ham stores put prices in their print or web advertising? Print, with its relatively long lead-time I can *almost* understand, although Lee Andrews manages, but not having up to date prices on a website is inexcusable!

Speaking of which, here's an open question to all Ham and/or retail radio stores. Why do so few have an "effective" website? A wealth of IT talent abounds in the Ham fraternity, one only has to look at a few of the Amateur Radio websites, including the various WIA sites, to see that. I don't expect the full e-shopping bit, just an effective site, easy to navigate with all the required information including tech-specs and price!

Perhaps the IT industry has spoiled me!

Norm McMillan VK2XCI

Info wanted

I have a Multi Band Quad Hub marked "CLARK VK3AS" with some parts missing. There was article in "Amateur Radio" way back in the early 1970s if I remember correctly. Could someone help me with some info, please.

Craig S. Martin VK2ZCM

Views expressed in the 'Over to you' column are those of the authors, and do not necessarily reflect the policies of the Wireless Institute of Australia.

Send contributions to:
The Editor, Amateur Radio Magazine, 34 Hawker Crescent, Elizabeth East SA 5112 or email: edarmag@chariot.net.au

Silent Key

Col Wright, VK7LZ

The 22 March 2004 saw the passing of Col Wright VK7LZ, Tasmania's oldest amateur and patron of the Wireless Institute in Tasmania at age 92.

Col built his first crystal set about 1925 when he was 12 and listened to amateur station 7BC on Sunday afternoons. He obtained his amateur license in 1933 and became active on the HF bands. Later, he had a regular program for broadcast listeners on the 200 metre band.

Following service in the RAAF during World War 2, Col became very active on the VHF bands, 50MHz and 144MHz. He even managed to contact Melbourne on 288MHz. Later on 432MHz with his 64 element array he regularly contacted Victorian stations from Launceston. Col held records on 50 MHz, 144 MHz, 288 MHz and 432 MHz.

Col became very active on amateur satellites when they first started and obtained one of the first certificates for working 1000 stations via satellite. In between all this VHF and UHF activity he managed to contact 300 different countries on HF.

Col was very active in the WIA, being the main organiser of the Northern Zone when it started in 1938 and reformed in 1947. Col was a life member of the WIA.

In recent years Col attended the Wednesday lunch time get-togethers at the Queen's Domain and was always interested in and encouraged technical developments and the construction activities of others.

Vale Col.

Richard VK7RO & Rex VK7MO

AMSAT

Bill Magnusson VK3JT

Meanwhile, back at the farm, it's time to take stock

Right now you could be forgiven for thinking things have been better in the amateur radio satellite game.

The prospects of getting AO-40 back are getting slimmer by the week. Despite the on-going efforts of the worldwide group of control stations, it has not responded to any commands for a couple of months. On one occasion several weeks ago Colin Hurst VK5HI heard what sounded like a peak in the noise level around the beacon frequency when certain commands were given. This report caused everyone to re-double their efforts but unfortunately other control stations have been unable to duplicate the situation and hear the noise. AO-40 may be lost or at best it could take a long time for the battery problem to clear, perhaps in the same fashion that gave us back AO -07.

So, what's the state of the high orbit birds at present? AO-13 de-orbited and burned up a few years ago due in part to a malfunction during its launch making the orbit unstable. So the high orbit contingent now numbers only one and that old campaigner, AO-10 has been out of control for many years and is semi-operational to put the best face on it.

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an email mailing list for breaking news and such things as software releases. Members use the AMSAT-Australia HF net as a forum.

AMSAT-Australia HF net

The net meets formally on the second Sunday evening of the month. In winter (end of March until the end of October) the net meets on 3.685 MHz at 1000 UTC with early check-ins at 0945 UTC. In summer (end of October until end of March) the net meets on 7.068 MHz at 0900 UTC with early check-ins at 0845 UTC. All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's email address is:
vk5agr@amsat.org

Good contacts over long distances are reported from time to time but it is by no means regular in operation and can no longer be relied upon. Similarly our digital satellite "fleet" which at one stage numbered three 9600 baud and two 38k4 satellites all built in the Surrey mould, is now down to one semi-operational 9600 baud satellite and ironically that too is the oldest in the fleet, UO-22. It goes into eclipse for long periods but when it is in full sunlight the performance is just as good as ever. The remaining 38k4 bird, MO-46 is only partially active and is often turned off for long periods. That has struck a discouraging blow to the large number of digital satellite operators who some years ago made up the keenest core of satellite users. We were looking forward eagerly to faster baud rates and higher resolution cameras but those ideals seem to have been put on hold indefinitely.

AO-7, which came to life again after almost two decades of silence, is struggling along and providing some irregular communications when in sunlight. PCsat has been kept partially alive for about two years now by a dedicated group of controllers but in essence it too is virtually dead from an operator's point of view. The last of the Russian RS series, RS-15 is not responding to commands and it seems to be dead or damaged. FO-20 is listed as semi-operational but is far from reliable. The last of the 1200 baud BBS type satellites IO-26 has problems and the control team is trying without success to upload new software for the BBS so at present no uplinks are available. Even the old faithful UO-11, now in its 21st year has been sluggish in operation lately. It never did have any communication facility being one of the early "beacon-only" satellites but it did have a large following of dedicated users, particularly among educators.

The International Space Station's ARISS project is listed as operational but in fact has been very unreliable since the Shuttle accident. I guess the crew have been pretty busy one way and another and are concentrating on scheduled school contacts rather than general amateur radio chatting. The digipeater is turned on sometimes but is off for long periods. It's hoped this situation will improve as time goes on and operations return to normal on ISS and to this end the ARISS equipment has received some welcome upgrades in recent months. It is approaching full functionality. AO-16 is listed as semi-operational but is really only in APRS digi mode.

Now, looking back, that's not a very encouraging overall situation, so it may be time to take stock of what is around and what is on the horizon. FO-29 is listed as being in mode JA. That means analog operation so SSB and CW stations can use the transponder. I have no experience myself but reports on the AMSAT-BB seem to indicate that the JA mode provides good communication.

The Fuji web site is notorious for being out of date with its information so it's better to look on the BB for late status reports on this satellite. AO-27 always seems to be listed as operational but its schedule only applies to its time orbiting over the USA and environs. It has never been turned on down this way so don't be fooled. Again SO-41 is listed as operational but I have yet to hear any activity from this bird. In similar vein SO-50 is listed as operational as a mode-J FM repeater. I have not had any reports of contacts recently but some people claim that it's up and running. It requires a 67Hz tone for operation on demand. There are frequent reports on the BB of it being unworkable. My last information is that there are stations in VK authorised to turn on this bird when it's over this part of the world.

If your taste turns to digipeating UI frames (packets) through satellites then you have a couple of choices. AO-16 is listed as turned on for digipeating UI frames and I guess this would be of interest to the APRS gang. NO-45 fills a

similar role and is also listed as operational. Although not in very good shape PCsat NO-44 is also listed as being in APRS digi mode.

The latest information on the condition of these birds is available by looking up the latest Amateur Satellite Report on the AMSAT-NA web site. You can subscribe to this service by following instructions on the web site. Remember though, it's only as good as the incoming information. The list managers are always on the lookout for up to date information. If you know of any variations from the listed information please let them know. Your reports will be welcome and will be included in the list.

That's about the current situation and it doesn't paint a pretty picture, but there are some good things in the pipeline. If you visit the web site of KD4APP at http://kd4app.webhop.org/ you will see a compact list of current and projected satellites. The list of projected satellites looks a bit too good to be true and some of the birds listed as being in the pipeline may never get off the ground. Some are University projects and may or may not have an amateur radio component when launched. The only ones I have been able to get any firm information on are ECHO which will be launched later this year, EAGLE which is slated for launch in 2006 and PCsat-2 which is also listed for launch in the near future and has undergone most testing already. Full information on all these satellites is available on the AMSAT-NA website by following the various links.

AMSAT-DL's Mars mission is moving right along

This ambitious project, at present named "phase 5A" is centred around the University of Marburg in Germany and is largely the brainchild of Dr Karl Meinzer DJ4ZC.

With Karl's close involvement you can be sure it will have some amateur radio content. The exact nature of that content has not yet been divulged but it is virtually certain that it would not include transponders of any kind. The communications link budget will be taxing enough but the timing problems caused by the vast distances would render anything approaching "real-time" operation right out of the means of ordinary amateurs and would tax even the keenest operators with state-of-the-art gear. The most any amateur satellite operator could hope for would be some sort of telemetry system, probably 400 baud or lower. A number of tests have already been made from the Bocham test site of the proposed earth station for P5A using the telemetry signals from various Mars missions currently in progress.

Surprisingly good results have been achieved by other amateurs using dishes as small as 3 metres and more or less standard EME class receiving gear coupled to DSP soundcard software. Detecting such a signal from a commercial satellite is one thing but actually decoding telemetry from P5A may well be another kettle of fish. It may come to pass that the job will be beyond the resources of operators with even quite good Oscar class or EME class stations.

It will be a fantastic challenge for those able to 'tool-up' for the job but would hardly be of consuming interest to the vast bulk of satellite operators. We'll certainly be watching developments with great interest.

Another worrying threat to satellite bands

A recent posting to the AMSAT-BB pointed out that repeater frequencies in Sweden had recently been changed and some were now listed as having uplink channels in the satellite bands.

It appears that this situation has been brought about to avoid ISM interference, which is a particular problem in Europe and becoming critical in Scandinavia. It can render repeaters unusable and it seems that juggling uplink frequencies is the only way out. The situation is to be brought to the notice of the Swedish amateur radio band planners in the hope some changes can be made.

It just goes to show how closely intertwined these matters can be. We can only hope similar situations don't arise here and that something can be done to reach a solution to the problem. I can remember Scandinavian amateurs being very active back in the early days of AO-10 and AO-13 when footprints dictated that antennas at both ends of the contact point close to the horizon.

With repeater DX-ing gaining in popularity, increasing numbers of operators will be using high gain arrays and high power to access distant repeaters. It has the potential to become a big problem to satellite operators if not addressed in the planning stage. Satellites by design carry very sensitive receivers. One only has to recall the problems from Asian taxi-phones and fishing boat radios pirating on 2 m and 70 cm when satellites rise to our north. And they are only running low power and omni antennas.

ar

Plan ahead...

GippsTech
July 3rd and 4th

Remembrance Day Contest
August 14th and 15th

International Museum activation
August ?

International Lighthouse activation
August 21st and 22nd

JOTA
October 16th and 17th

Contests

Ian Godsil VK3JS

Contest Calendar May – July 2004

1-2	May	Ten-Ten Intl. Sprint QSO Party	(CW/Digi)
1-2	May	ARI Intl. DX Contest	(CW/SSB/Digi)
8/9	May	CQ-M Intl. DX Contest	(CW/SSB/SSTV)
15/16	May	King of Spain Contest	(CW)
22	May	VK/trans-Tasman Contest	(SSB)
		Web Site - http://home.iprimus.com.au/vktasman/rules.htm	
29/30	May	CQ WW WPX Contest (CW)	
5	June	VK/trans-Tasman Contest (CW)	
		see Web Site above	
12/13	June	ANARTS Contest (RTTY)	
12	June	Portugal day DX Contest (SSB)	
12	June	Asia-Pacific Sprint Contest (SSB)	
19/20	June	All Asian DX Contest (CW)	
26/27	June	Marconi Memorial Contest (CW)	
26/27	June	King of Spain Contest (SSB)	

Greetings to all readers

Are you methodical and dedicated?

Recently I picked up a free magazine whilst shopping. Its tenor was towards being organised and being positive. These concepts are certainly still very valid for those wanting to make a successful career. I think we all know that little effort brings little serious reward.

Are these ideas valid for hobbies? Yes, I think they are. Certainly, if you are taking part in an hobby there is not normally pressure to be the tops, unless you are in a competition – swimming, bowls, best roses or whatever. If we apply this to our AR hobby, is not a contest a competition? Therefore, being organised and positive in our approach is most relevant.

How many of us seriously prepare for a coming contest? Do we know the rules? Have logging materials prepared in advance? Check that our equipment is in good working order (isn't it amazing how little things can go astray once a contest is under way)? Make sure that we have had plenty of rest in the week leading up to the contest?

These seem to be self-evident, but how many of us take them seriously? We don't have 48-hour contests in Australia, but some USA DX events are. Many serious US contesters go off to DX sites with huge amounts of equipment. All very fine and interesting, but sleep then becomes a priority. It is not normal to sit up for 24 or 48 hours. The risk of making mistakes probably increases exponentially as the hours pass. So we can help ourselves by getting to bed early on the nights preceding the contest weekend. It certainly does help.

So as we enter the 2004 VK/ZL contest period I commend to you the time-honoured principles of being organised and positive. Keep your actions positive because your actions become your values.

Jack Files Contest

Last year a request was made for suggestions for enhancing this VK4-based event and I know that ideas were put forward. I have received a note from John Spooner VK4AJS that this year's contest will follow the same lines as last year and that any changes will be introduced in 2005. Please see vkham.com contest page for details and rules will be published here next month.

Good luck in the contests.

73, Ian Godsil VK3JS

CORRECTION

Summer VHF-UHF Field Day

A log was accidentally omitted from the results for the last Summer VHF-UHF Field Day. The details are:

Section B - Single operator, 6 hours

VK5ZUC - Andrew Russell

Score: 6m 43, 2m 237, 70cm 110, total 390 points.

Rules Summary: VK/trans-Tasman Contests

(Summary only. Full details available on web site

http://home.iprimus.com.au/vktasman/rules.htm)

From Bruce Renn VK3JWZ, Contest Manager

Dates: Sat 22 May 80 metre Phone
Sat 5 June 80 metre CW
Sat 17 July 160 metre CW/Phone

Time: 0800 - 1400 UTC

Frequencies: 80 m Phone 3.535 - 3.625 MHz
80 m CW: 3.500 - 3.550 MHz
160 m CW: 1.810 - 1.835 MHz
160 m Phone: 1.840 - 1.875 MHz

Categories: Single Operator, Multi-operator, QRP, SWL

Callsigns: VK4s north of Tropic of Capricorn to add "Central" after callsign. QRP stations to add "Quebec" or "/Q".

Scoring: See detailed rules for individual scores. **Final Score** will be sum of five (5) highest scoring hours.

Logs: Separate log for each Category entered. New log sheet for each separate hour, with hourly totals at bottom. Each contact to show time (UTC), callsign worked, exchange.

Summary Sheet shall accompany each log showing operator's callsign, name and address, email (if applicable), categories entered and points claimed.

Send Logs by mail to: VK/trans-Tasman Contest, 28 Crampton Crescent, Rosanna, 3084. Logs may be sent via email to: vktasman@hotmail.com

CLosing Dates:
19 June (80 m Phone/SWL)
3 July (80 m CW)
15 August (160 m Phone/CW)

Awards: Various awards available. See detailed rules.

ar

Club News

Fort Queenscliff – Telegraph Station

The Geelong Amateur Radio Club have undertaken to assist the Friends of Fort Queenscliff in their effort to turn the 150 year old Telegraph Station within the Queenscliff fort into a display area which will be included in the tours of the Fort.

To quote from the letter from Major General Mike O'Brien. In one room "We are working towards four to six story boards that have about 200 words of text and include photographs where we can find them. In the other room we would plan to display hardware such as Morse keys and similar telegraph equipment (of the period)."

In view of the worthiness of this idea and the need to preserve the history of the telegraph station and its very important role in shipping, the GARC asks for assistance from anyone who can provide

1 any information
2 any photos (even for copying)
3 hardware either as a gift or on extended loan

Any offers -please contact initially David Godfrey jadlgod@ozemail.com.au OR Mike O'Brien MikeOBrien@bigpond.com

David Godfrey VK3AZX

North East Radio Club

Saturday March 20th several members of the club ventured out for the John Moyle Field Day. A station was set up at Mt Gawler and operated for the first 6 hours of the contest. Quite a few contacts were made on 20 and 40 metres. The 6m, 2m, 70cm and 23cm VHF and UHF bands were used with over 100 contacts made. The weather was fine and warm; all operators had a great day.

- The May meeting of NERC will be on the 14th and will be a presentation on the Pedal Prix. Alex McCallum will speak on his involvement in this activity.
- June 11th will be a presentation on computer log keeping.
- July 9th is the Club AGM. Food and refreshments will be provided on the night. Time now to volunteer for the committee.

I will report on our annual buy and sell next month. This was held on April 17th.

The nights on Atmel processors held on the last Friday of each month are continuing, it is expected these will run until the end of the year. This will allow members to construct their own projects as they become familiar with programming.

The North East Radio Club meets on the second Friday of each month at the Ardtornish Primary School, Saarinen Ave St Agnes. Doors open at 1930.

David Clegg VK5AMK

Waverley Amateur Radio Society - Annual Club Auction

The club will be holding its annual auction on Saturday, June 19th at the clubhouse in Vickery Avenue, Rose Bay, Sydney. Gates open 8:30 and the sale starts at 10:30. Goods consist of useful ham radio, computer and electronic gear and it is open to all wishing to buy or sell. Full details are available on the club's web site at www.vk2bv.org or by phone from Simon VK2UA, on 02 9328 7141.

Club News

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The March meeting was a members' Buy and Sell. As usual it was well attended and some money changed hands as one person's junk became another person's treasure. Many more members took the opportunity to renew their subscriptions at the old rate rather than have to pay more after the end of April. By the time you read this it will be too late to 'get in early'.

A week or so later about 20 AHARS members went to the 'wind-up' barbecue where we heard about the recent Scout radio activities associated with the Jamboree and about the changes under consideration for the 'remaking' of the WIA. We were reminded that the proposed constitution for the new company was included in the March issue of AR and it was recommended that we read it to understand what changes were coming.

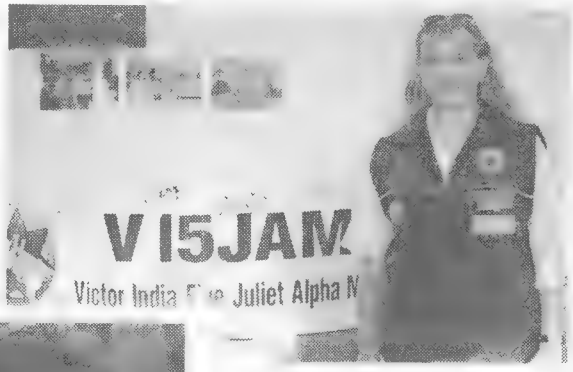
Everyone (not only the YLs) also enjoyed the Ikebana style flower arranging demonstration given by Alicia and the winners of the raffle were delighted to be allowed to take home the finished products. Next time a certain amateur talks about not having room for his amateur gear because of the 'pots' in the house, it could be one we know. Beware of garage sales!!

As usual VK5BAR was busy during the John Moyle Memorial Field Day. This year was the 'year of the LEDS'. Geoff used several LEDs to light the outside of the building during the night hours (it was during the dark of the moon, which has a close resemblance to the inside of a cow). Later, the kitchen was 'invaded' by Daleks. Three members each with a LED 'headlamp'.

We also hope a high score will earn its just reward.

Anyone in Adelaide on the third Thursday of a month is very welcome to attend an AHARS meeting. Contact Geoff VK5TY or Paul VK5PH for more details.

A general view of the members Buy and Sell AHARS



Leanne Adcock (RIG) in front of a display about the Jamboree station.

Shirley VK5JSH with her winning flower arrangement

"The Daleks" Steve VK5ZHT, Paul VK5ZRT, and Chris VK5YME

Geelong Amateur Radio Club

President's Report

Looking back over the last year from June 13th 2003 I find much for the GARC to be satisfied, even pleased about. The committee took the suggestions put forward at the meeting on June 13th and worked their way through them. They have worked consistently in your interest to ensure a better GARC. You each received a copy of those suggestions and of the 14 points needing action only two were not discussed or acted upon. They were 'Visit other clubs to gather ideas' and 'Some possible association with amateurs in the Werribee/ Hoppers Crossing area' This is not to say that more could not have been done, but in general members should be well satisfied with the effort put in by their elected committee.

Meetings have been better attended, but it is a great pity that more members have not taken advantage of the excellent quality of the presentations the club has enjoyed, and the camaraderie offered by people of like interest. A look at the syllabus items illustrates the range of topics, all with a distinctly amateur bias and many at the cutting edge of electro-technology.

Some highlights of the year were

- Field operations Black Lighthouse, Ross Hull, VHF field day, RD contest, John Moyle (15 callsigns in the field);
- Christmas breakup at Barbara and Mike's place;
- Club dinner.

I'm sure that you will agree that the degree of activity indicates that GARC is in robust good health. Our premises and equipment are excellent and in good repair, and our finances are sound.

BUT

Too much still revolves around too few. Certainly the number of presenters has increased and as a result the topics covered will diversify – look at the 2004 syllabus; but we need more people prepared to contribute. We all have a story so please share yours with other members. It does not need to have a radio content. It could be a holiday, another hobby, riding a bicycle, catching crocodiles – the list of possibilities is endless. Please see David VK3XLD, our syllabus convener, to register your presentation.

For the incoming committee there are some matters that will need attention viz.:

- Black Lighthouse, and Friends of the Fort development of the old signal station
- Marconi anniversary
- JOTA
- The new club emergency vehicle
- The need for another club project (to follow the huge success of the antenna project)

Finally I wish to thank everyone for their support of the GARC, the committee and myself. There has been so much active support that I am reluctant to single out special efforts but, as in all things, some do more than others. These are:-

Lee VK3PK and his helpers with the training class- the future of AR

Mike VK3ASQ and **Barbara** for duplication, newsletter distribution –at their cost

Regular presenters	Chas VK3BRZ
	David VK3XLD
	Lee VK3PK
Syllabus	David VK3XLD
Minute secretary	Ken VK3AKK
Minutes to web	Doug VK3TRD

The rising enthusiasm and interest among members both old and new is tangible and can only assure better outcomes for the GARC in 2004/5.

The Committee as elected at the A.G.M. on 2nd April 2004 is

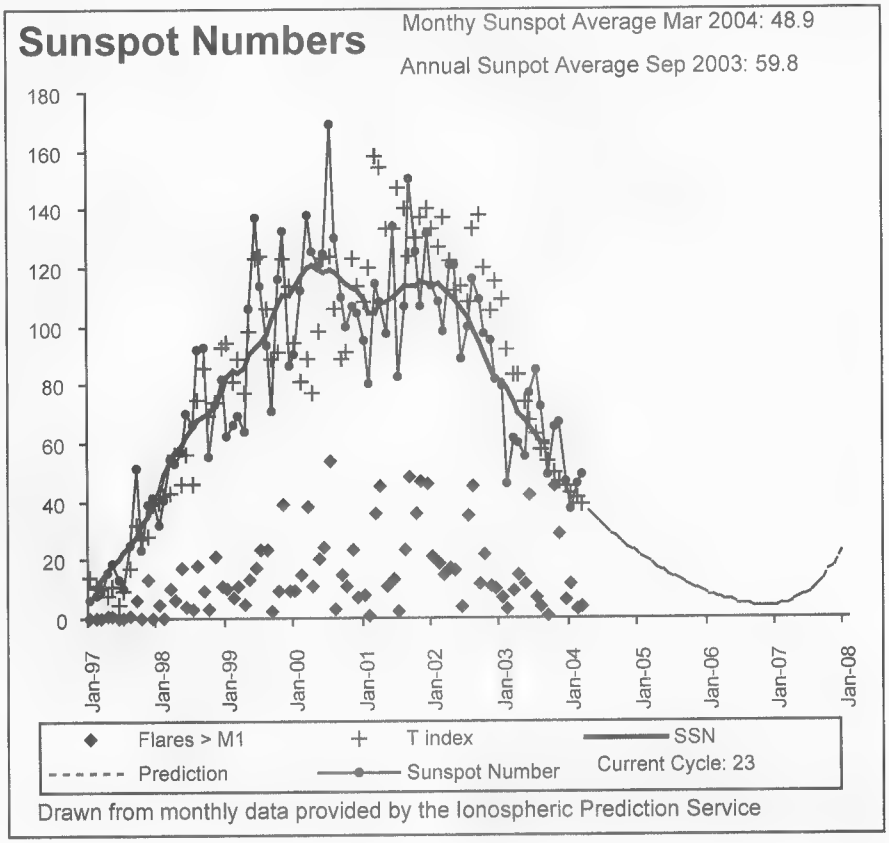
President David VK3AZX

Secretary Ken VK3AKK

Treasurer Bob VK3HFL (also President nominee 2004/5)

Committee Kelvin VK3ZPK, Lee VK3PK, David VK3AZX

David Godfrey VK3AZX



VHF/UHF – An Expanding World

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@telstra.com

Weak Signal

David Smith - VK3HZ

There's been a bit of action across the Bight during March – possibly the last for the season. On the evening of March 22nd, Wally VK6WG worked VK5ZBK, VK5DK, VK3ZQB, VK3II and VK3AUU on 2 m. He also worked VK5ZBK, VK5DK and VK3ZQB on 70 cm. The following morning, Wally again appeared and worked VK3II, VK3HZ, VK3ZUX, VK5DK, VK5ZPS and VK5NY on 2 m. He also worked VK3HZ and VK3ZUX on 70 cm – a distance of around 2,600 km. At the time, the VK6RST Mt Barker 70 cm beacon and the VK6REP Esperance 2 m beacon were both audible at good strength in Melbourne. To add to the action, VK6EWI, a DXpedition station on Woody Island off the coast of WA near Esperance (and, needless to say, a very rare gridsquare on 2 m), popped up and worked VK5NY, VK5KNB, VK3AUU, VK3II and VK3ZUX. The DXpedition guys couldn't believe their luck in having a good opening on 2 m while out on the island (Murphy usually strikes and the bands all close down). Meanwhile, Wally VK6WG spent over an hour on 70 cm ragchewing with VK5NY, VK5ZPS and VK5DK with signals consistently S8 to 9 before the band closed down at around 0400Z. That evening, VK6EWI worked VK5AKK, VK5DK and VK5NY but nothing heard of them in VK3.

Then on the morning of March 26th, Leigh VK2KRR, near Wagga Wagga, heard the Mt Barker 2 m beacon at about S2. He telephoned Wally VK6WG who came up on 2 m and contact was made at S8 to 9. An attempt was made on 70 cm but, with antennas cross-polarised, nothing was heard. The path remained for about an hour before Wally had the call to breakfast. The distance between them is 2645 km, but with a difficult path over land. It was interesting to note reports from VK5NY and VK5ZK in Adelaide, in the same line to Albany as Leigh, both hearing the Esperance beacon but not Mt Barker, whereas Leigh could hear Mt Barker but not Esperance.

Barry VK3BJM reports that he has been travelling again, from Kyneton, Vic, to Fowlers Gap, NSW, to continue exploring Aircraft Enhanced Propagation (AEP) possibilities in far western NSW, and to activate QF08UV over the weekend of 3-4th of April. Whilst there, he had contacts with VK2KRR (684 km), VK2EMA (on 2 m and 70 cm) (551 km), VK5ZK (560 km), VK1DO (860 km), VK3AFW (813 km), VK2ZAB (923 km), VK3II (882 km), and VK5UBC (474 km). Some of these contacts were via troposcatter, some via AEP. Mobile 2 m contacts were also had with VK3GOM, VK2KRR, VK3CY, and VK5ZK, whilst enroute to Fowlers Gap.

Fowlers Gap is located 114 km north of Broken Hill, on the Silver City Highway. Equipment used was an IC706MkIIg to (on 2 m) a 150 W PA, with inbuilt 21 dB pre-amp, then 6 m LDF4-50 to a 10 element DL6WU yagi. On 70 cm, a 100 W PA, with inbuilt 12 dB pre-amp, via 6 m of LDF4-50 to a 15 element DL6WU yagi. Thanks to John VK2TK and Ron VK3AFW for extended assistance via the HF liaison frequencies, and to all who listened and attempted contacts.

Jim VK3II reports some success in the reduction of interference at his QTH. When conditions are reasonable to the west, he has been suffering from "crud" between 144.295 MHz and 145.300 MHz, effectively wiping out the beacon segment. The source of the interference was narrowed down to the Colac ABC TV translator on channel 5A (sound carrier 143.724 MHz). He contacted the ABC about the problem who then passed the complaint on to Broadcast Australia (they operate the ABC transmitters). They called back to say that they know about the problem and are waiting on a bandpass filter which will be fitted to the translator in the near future.

EME

Doug VK3UM has been busy on the PC, working on some of his software that is widely used throughout the EME world. Significant upgrades have been made to the EME Calculator and the Site and Radiation Calculator, while new programs include the Transmission Line Calculator and Four Pole Interdigital Filter designer. The programs and details of the changes can be found at www.qsl.net/sm2cew/download.htm.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@telstra.com

Beacons

The Melbourne 2 m beacon, VK3RTG on 144.430 MHz, is currently off air. Building renovations at the site have resulted in the power being removed. This will be the situation for many weeks. The beacon may be temporarily relocated, pending an upgrade.

The Auckland 6 m beacon, ZL1VHF on 50.0433 MHz has been QRT since the start of April after the antenna pole was felled by chainsaw, cut off at ground level. The beacon will be recommissioned once several paperwork issues have been taken care of, and a replacement antenna pole has been installed. In the meantime, all equipment has been removed from the site.

Finally, congratulations to our "Digital Modes" man, Rex VK7MO, who has been awarded the WIA Ron Wilkinson Achievement Award in recognition of his achievements and contributions to the knowledge of other radio amateurs in relation to weak signal working on VHF/UHF and microwave bands.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital modes

Rex Moncur – VK7MO

Joe Taylor K1JT, continues to improve WSJT with version 4.6.3 including AFC for JT65 to allow it to cope with less stable rigs. He has also joined up with Alberto I2PHD, to combine WSJT with Spectran. From some initial tests it is particularly useful to identify a very weak signal on Spectran and then lock down the band in which WSJT looks to just a few Hz and sort out the desired signal from birdies.

Since JT44 came out with the ability to give perfect decodes at around –19 dB in a single line and around -22 dB with an average over 4 cycles, Joe has advanced things so that JT65A will produce perfect decodes at around –24 dB and perfect averages over 4 cycles at -26 or -27 dB (all with reference to the noise in a 2.5 kHz passband). A note of caution about WSJT signal reports– they are based on the average in the channel with the maximum level and if the signal drifts outside the channel (just a few Hz) during a cycle then WSJT signal reports can be quite misleading. For example Ian VK3AXH, has had problems with a wonkie crystal in his FT-847 that resulted in signal reports being up to 10 dB less than on a second more stable rig.

Rex VK7MO, will be on a DXpedition to VK6 in early May during the Eta Aquarids meteor shower and initially intends to operate from around Eucla on the WA/SA border. Rex will TX on 144.330, FSK441B in the first period and use the DXpedition procedures outlined on the NSW VHF Group DX site - http://www.vhfdx.oz-hams.org. He will work to the East Coast from 0630 to 0830 EAST. He will beam half way between Melbourne and Sydney so VK2/4 should use the southerly hot spot and VK3/7 the Northerly hot spot. Operations will commence on 1 May for a few days at Eucla and depending on progress a number of grid squares should be available on the way back up to mid May. Skeds to other areas will be possible at other times if you can catch his mobile within range on 0408 147 808.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

March has really pulled up the FM DX scene down south, with the change of seasons coming on and the shortening of daylight hours, things are really taking a dive, still some interesting contacts are being made though. Nice to see conditions returning to the Queensland coast after a wet and windy few months.

John VK2FAD has been able to repeat his interesting path into the Canberra 146.950 repeater again. This is an approximate 350 km trip across the mountains to Mt Ginini from Budgewoi. Good clean signal from John.

A freak change in conditions occurred along the VK4 coastal areas from 6th to 10th March and saw some great conditions down the coast from up north as indicated by the Hepburn charts.

Felix VK4FUQ at Ingham reports that the Mackay repeater was accessible most evenings and mornings. On Monday 8th the Mackay repeater was almost full scale at Felix's QTH and he was able to contact VK4LH, 4OG and 4DJC. Felix reports he was also able to work the Hayman Island repeater.

Later Felix made it to VK4RGA, Gladstone area repeater, and made contact with VK4JIN at Maryborough and VK4KKN in Gladstone. The distance to this repeater for Felix is 797 km and this contact just knocked Mike VK4MIK off top spot in the VK4 Division Repeater Distance Records by a mere 4 km. Well done to Felix for grabbing the top spot.

Later that evening Mike VK4MIK was able to work to the Townsville repeater and also made a simplex contact with VK4FNQ at Charters Towers on 146.500.

On Wednesday 10th Felix was able to work back to the Gladstone repeater again @ 797 km and also to the Springsure repeater @ 639 km and to the Hodgson Range repeater @ 491 km, which gave Felix 3rd and 4th spots in the VK4 Repeater Distance Records.

Felix also reports that while the Gladstone repeater was coming through, he copied VK4LC from Mt. Tamborine and amazingly, VK2MHB at Murwillumbah. Distance was 461 and 504 km respectively to the repeater.

Sat 13th March, small opening to Melbourne from south VK2. Colin in Melbourne worked VK2KRR twice simplex on 146.500, once in the morning once in the evening. Colin was a good signal up here at a 5/8 @ 334 km. Ian VK3ZZG also put in a very nice signal up here from Bendigo on both 2 & 70. Distance is around 300 km and Ian was 20 dB over on 2 m and a 5/5 on 70 cm.

The John Moyle Field day was held on 20th and 21st March. For a change, there appeared to be more SSB stations on air in comparison to FM stations. Admittedly the conditions were quite poor. The only DX FM stations worked here were VK3SAA near Ballarat @ 359 km and VK3CNE on Mt Macedon @ 320 km. Gavin VK3VTX was also heard in the noise at one stage, along with a number of other stations.

We welcome a new member to the FM DX ranks, Karl VK3HDX in Launceston. Karl recently passed his exams and is very keen on the VHF DX scene. With only a limited set up Karl has already managed to work right across Bass Strait into the Mt Macedon repeater @ 504 km.

While we're on the subject of VK7, one of the top FM DX stations out of northern Tasmania right now would have to be Dion VK7YBI near Burnie. Dion gets out very well with his new twin yagi array, and is heard at locations you would not believe. On Monday evening 22nd March, Dion reports that the conditions were quite exceptional, all stations heard on repeaters were also being copied on simplex and many repeaters were 60 dB+ with no pre-amp! Dion worked simplex on 146.500 with VK5HAY and VK5HCF mobile (Mt Gambier?). Dion continued to work VK3 stations and then, turning the antenna back to VK5, he worked John VK5DJ on Mt Gambier repeater, then John VK5NJ on the same repeater, as well as on simplex 146.500 where John gave Dion a 5/7 report. Dion was running only 2 watt over 573 km.

The following morning Dion VK7YBI found Shane VK5NRV on an Adelaide repeater and they both tried 146.500 simplex and made it through! Shane is at Woodside and signal reports were 5/3 both ways over the big 921 km path.

Interestingly, on 27th March Dion VK7YBI made a rare trip into the Cooma repeater 147.375 VK2RSE @ 630 km and was able to contact VK2DE and VK2HFM.

That's about it for this month.

Technical abstracts

Peter Gibson VK3AZL

The copper loop for 2 metre

This would have to be the ultimate 'plumbers delight' antenna.

In QST for December 2002, Dick Stroud, W9SR describes his experience in constructing a heavy-duty square halo (Squalo) antenna for 2 metre, using all copper components. This antenna is very sturdy, easily reproduced, performs well and is quite economical to make. In addition, it can be operated either vertically or horizontally.

Although construction is fairly easy, some basic plumbing techniques are required. The copper tubing is standard 3/4 inch thin walled tubing, available from nearly any hardware or plumbing supply store.

Carefully cut the tubing into the lengths shown in Figure 2 and assemble into the copper elbows. Make sure the sides are parallel and the two top sections are in line. Clean the ends of the tube that will engage the elbows with steel wool and apply a paste soldering flux to the area. Solder the corners with a propane torch, remembering that it takes time to get this much copper hot enough to properly flow the solder. After soldering, remove any excess flux and polish the antenna using steel wool.

The Figure 1 shows details of the connector mounting bracket, mounting plate and gamma match rod. All screws and other fittings unless otherwise specified should be stainless steel. The antenna mounting plate is not symmetrical to allow clearance between the gamma rod and the U-bolt.

The gamma match shorting strap is made of 0.020-inch brass stock and is 1/2 inch wide. It is held in place with

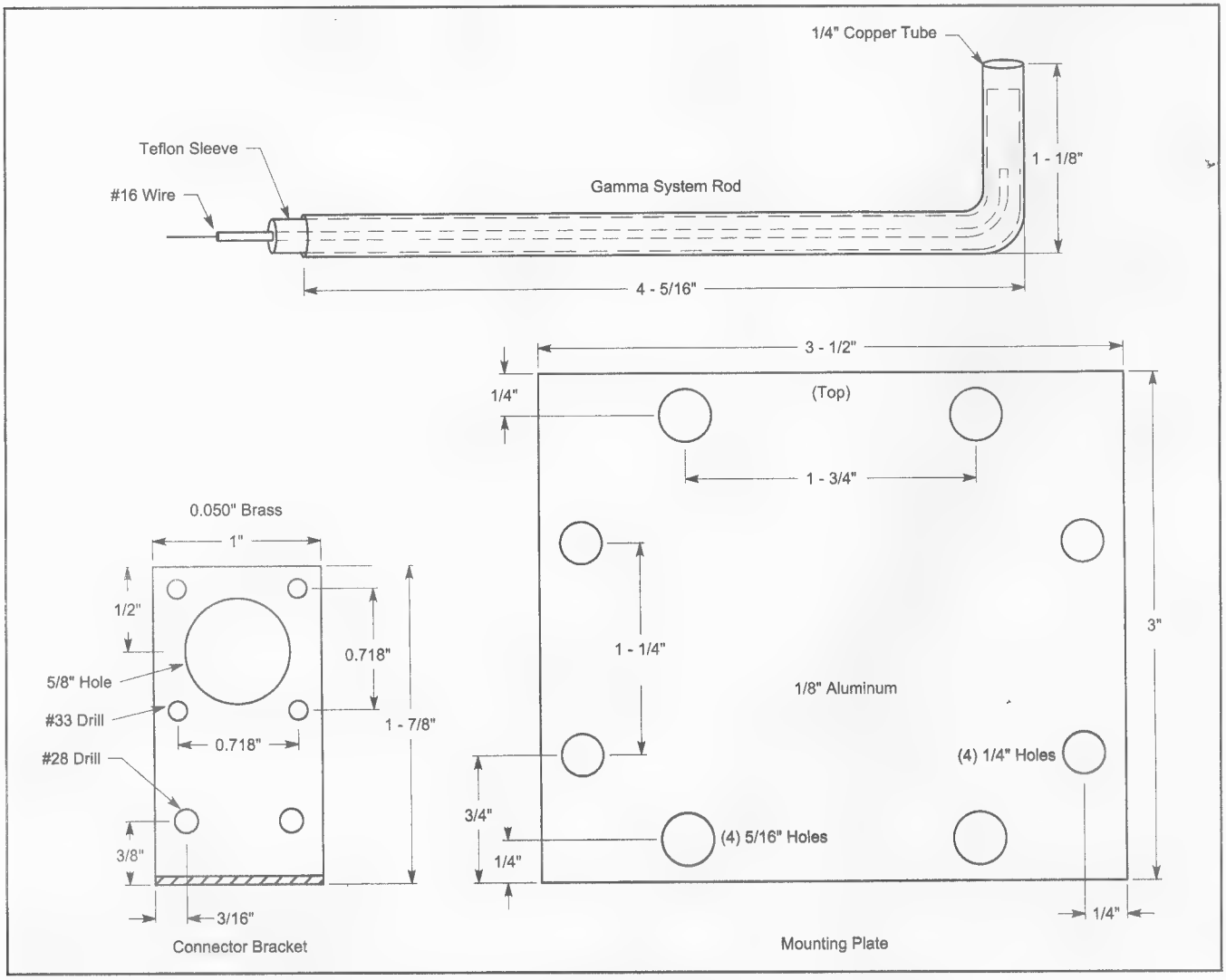


Figure 1. Gamma match, connector bracket and mounting plate details

stainless hardware. The gamma section is formed, as shown, from a 5 5/8 inch length of 1/4 inch OD soft copper tubing. A 5 1/2 inch length of 5/32 inch OD Teflon sleeving is inserted into the copper tube and a 5 1/2 inch length of #16 vinyl insulated wire is placed inside this sleeving. See the drawings for details of the gamma section assembly. The wire end of the gamma match is soldered to the coaxial connector centre pin.

With the gamma rod and connector in place, the two end caps can now be installed. With both caps fully seated, mark the positions with a felt tip pen as the reference points. All adjustments of the end caps should be equidistant from these marks.

For tuning, the antenna should be mounted at least 6 feet off the ground and clear of surrounding objects. The centre frequency can be adjusted by sliding both end caps in and out, equally. Moving them closer together will lower the centre resonant frequency by increasing the length of the loop as well increasing the capacity across the loop.

On the example described, the 2:1 VSWR bandwidth was about 4 MHz at a centre frequency of 147.000 MHz. If the constructional details have been followed closely, the VSWR should be quite low. If necessary, the gamma strap position can be changed slightly and the wire length can also be changed in small increments to bring the VSWR to 1:1.

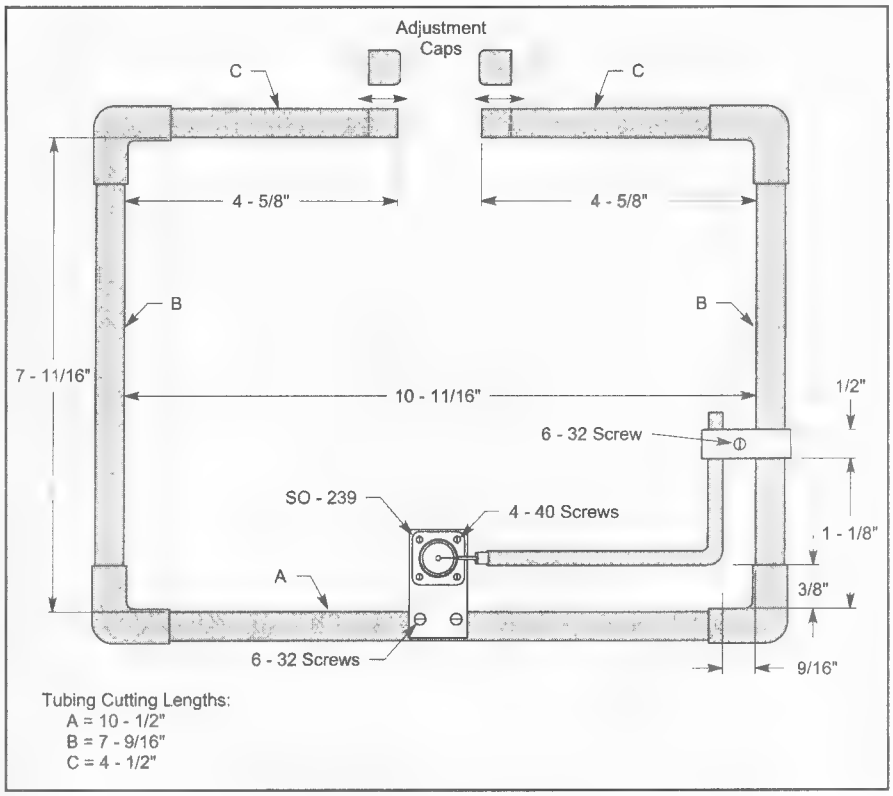


Figure 2. Construction details of main antenna assembly

After the adjustments are completed, both end caps should be secured to the end elements with stainless steel self-tapping screws. A low loss sealant should be placed over the back of the coax connector and the end of the gamma rod, to prevent entry of moisture. To preserve the finish and stop the copper from oxidising, the antenna can be coated with a clear protective finish, such as Krylon 1301.

Temperature measurements

In Maths Notes (CQ September 2003), Irwin Math, WA2NDM describes some experiments in electronic temperature measurement. A digital/electronic thermometer can provide a valuable addition to the experimenter lab, and fortunately there exist devices that are simple to use and do not require elaborate additional circuitry to make them work.

One of these is the National Semiconductor LM335. This component is described by the manufacturer as a "precision temperature sensor", and it is ideally suited to our needs. The version recommended comes in a TO-92 package (the common plastic transistor package with which we are all familiar), although a surface-mount package as well as a metal version are also available. The LM335 is actually a specialised integrated circuit that can be thought of as a temperature-varying zener diode. The TO-92 version of this IC is linear and usable over a range of –40 degree to +100 degree C while other versions can operate from –55 degree to +125 degree C.

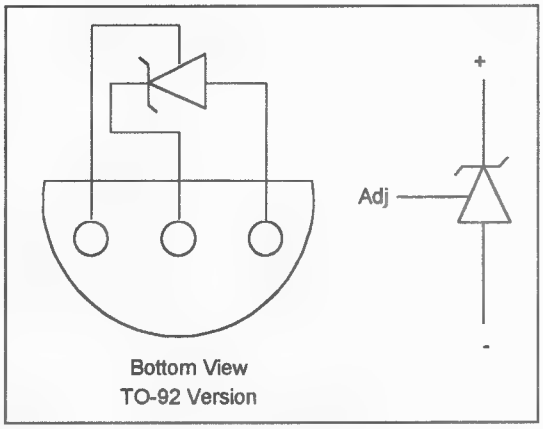


Figure 3 – Pin connections and symbol for LM335

Technical abstracts

continued

Accuracy is within 1 degree C over the entire range, certainly close enough for most experimental measurements. Figure 3 shows the symbol and pin connections for the TO-92 version.

Figure 4 is the basic circuit of a centigrade thermometer. A reference diode and op-amp are used to provide a calibrated offset voltage for the LM335, and a digital voltmeter (DVM) provides a direct indication of temperature. (Any of the standard op-amps, ranging from 741 to the later FET input units should be suitable for this circuit. The pin connections refer to the standard 8-pin package.)

To set up the circuit, adjust the 2k pot a voltage reading of 2.732 volt between pin 6 of the op amp and ground with a DVM. Next, place the LM335 in a known temperature and adjust the 10k pot for the correct reading on the DVM used for the measurements. If you do not have access to an accurate thermometer to determine the correct temperature at which to calibrate the circuit, simply prepare a mixture of crushed ice and water. Stir the mixture so that you have a good slurry of both ice and water. The temperature of such a slurry is very close to 0 degree C, and as a result, can be used to calibrate the thermometer at this point.

For ease of using the thermometer it is a good idea to enclose the LM335 in a probe-type housing. Figure 5 is a diagram of the details of such a probe. To make the probe, obtain a common plastic drinking straw and cut it to a length of about 6 inches. Next, close one end of the straw with a small piece of masking tape. Solder wires to the LM335 using a 3 foot length of two-conductor shielded wire. Connect the wires to the Adj ("emitter"), the + ("base") and the shield to the – ("collector") lead. Be sure that the leads do not short to one another. Now liberally coat the entire assembly with epoxy and slide it into the open end of the straw until the top of the TO-92 just makes contact with the masking tape. If necessary, fill the rest of the straw with epoxy so you have a totally enclosed assembly. When the epoxy hardens, remove the masking tape and clean the end. If needed, add a bit more epoxy and then lightly sand the end to obtain a smooth, flat finish. The result should be a reasonably rugged probe that will be waterproof and insulated. A three pin connector on the cable and a mating three pin connector on the thermometer enclosure is now all that is necessary to complete the project.

To make a measurement, lightly press the tip on the component you wish to check and wait for the reading to become stable. A bit of silicon grease on the probe will often make better contact and result in a more accurate reading

For additional circuits and more details regarding the versatile LM335, visit the National Semiconductor website at 'www.national.com'.

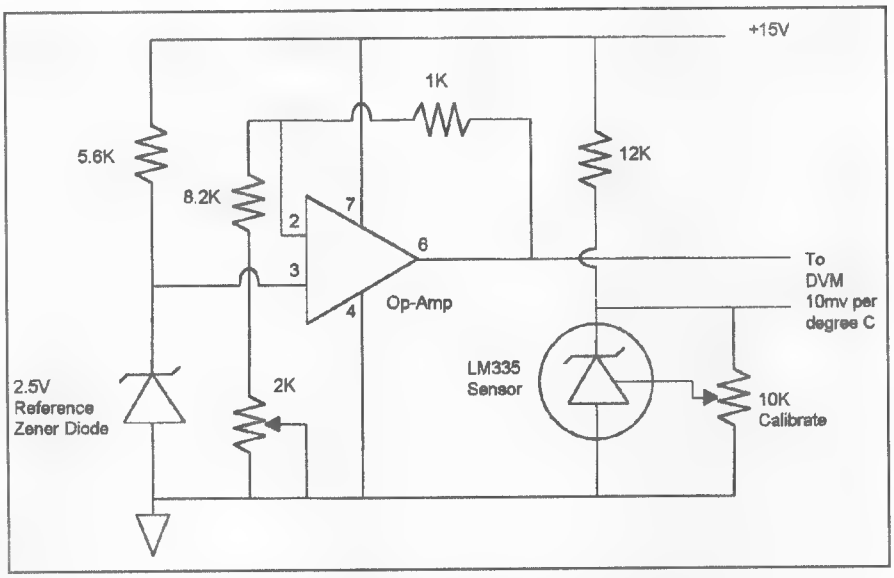


Figure 4 – Centigrade electronic thermometer

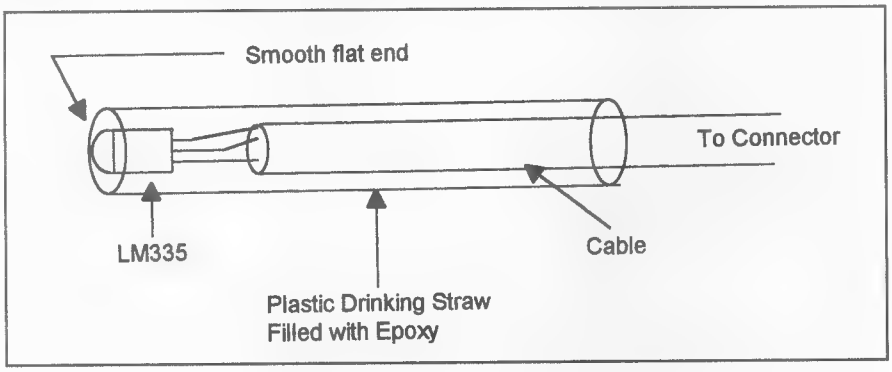


Figure 5 – Details of temperature probe

Silent key

John Bugler VK4AJR

John Bugler VK4AJR, passed away at his home at Riverside Brisbane on 18th March 2004.

He had come through a triple by-pass well, but passed away peacefully at home about a month later.

Until recently, John held callsigns VK2AJB and VK2JRB when he lived at Gordon, and was a member of several nearby clubs.

Submitted by Bob VK2CAN

continued

A QRP ATU

David Littlewood, M3DCT describes a QRP ATU to use on the HF bands after acquiring his new M3 licence, in RadCom for May 2003.

This ATU was initially built to match a half size G5RV antenna. A pi-configuration was chosen to cope with the range of VSWR levels encountered on all HF bands from 80 m to 12 m. It can cope with a wide range of load impedances, from a few tens of ohms, up to several kilohms, even when these include significant levels of reactance. It is thus suitable for end fed wires as well as the half size G5RV. Figure 6 shows the complete circuit.

The construction is not critical, and the unit can be mounted in any suitably sized box. The box should ideally be of metal construction to provide some RF screening, but the prototype was built in a partially plastic box with no adverse effects.

The six coils are wound on six, separate T68-2 iron dust toroids, each of which provides its own closed magnetic path. Therefore, very little RF radiation is emitted from the cores.

The circuit shows some extra circuitry that allows transverters to be selected, as well a 30 W to 1 W, 15 dB attenuator. This attenuator doubles as an acceptable 50 ohm dummy load as it provides a reasonable match to 50 ohms. All or part of this part of the circuit can omitted if desired.

Calculations determined that a maximum inductance value of 30 µH would be required. This value is built up by using 6 separate inductors, increasing in a binary sequence from 0.5 µH. This sequence gives a range of 0.5 µH to 31.5 µH in 0.5 µH steps. The inductors are wound on Amidon T68-2 iron dust toroids of 0.68 in diameter and colour coded red. Table 1 shows the number of turns required for each toroid.

Coils 1-4 are wound with single layer 0.8 mm enamelled copper wire. Coils 5 and 6 are wound with 0.5 mm wire with coil 6 requiring two layers.

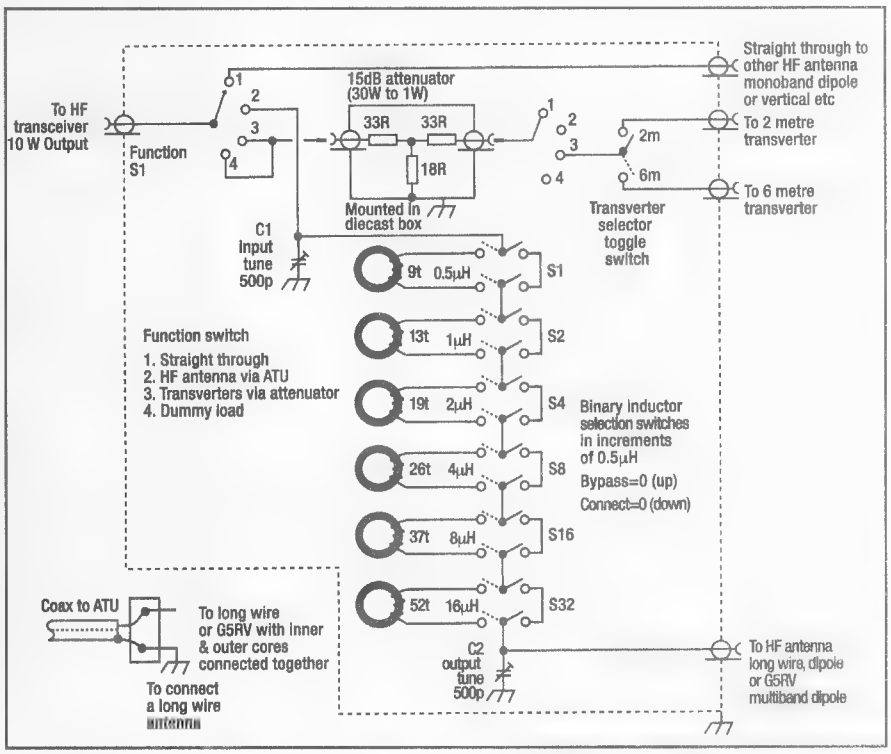


Figure 6 – Complete circuit of complete circuit of QRP antenna tuning unit

TABLE 1

Coil	Number of turns	Inductance (µH)
1	9	0.5
2	13	1.0
3	19	2
4	26	4
5	37	8
6	52	16

TABLE 2

Band	S1	S2	S4	S8	S16	S32
80*	1	1	1	0	0	0
40	0	1	0	0	0	0
30	0	1	0	0	0	0
20	0	0	0	0	0	0
17	0	1	0	0	0	0
15	1	0	0	0	0	0
12	1	0	0	0	0	0
10	0	0	0	0	0	0

*assumes that half sized G5RV is used with normal coaxial cable, and run as quarter wave dipole. As this is not very efficient, it may be better to use it as Marconi longwire tuned against earth on this band

TABLE 3

Band	S1	S2	S4	S8	S16	S32
160	0	1	1	1	0	0
80	0	1	0	0	1	0
40	0	0	0	1	0	0
30	0	0	1	0	0	0
20	0	1	0	0	0	0
17	1	0	0	0	0	0
15	1	0	0	0	0	0
12	1	0	0	0	0	0
10	0	0	0	0	0	0

continued on page 50

The solar cycle

Bill Isdale VK4TWI

We have become used to seeing the data of solar activity put together by the Commonwealth Government Ionospheric Prediction Service. This organization has observatories monitoring solar activity and from the observations, carried out several times a day, are produced such things as the sunspot numbers graph we see each month in Amateur Radio magazine. The I. P. S website provides an up to date display of the results of their observations and calculations in various forms including maps showing what frequencies are going to work to reach particular destinations.

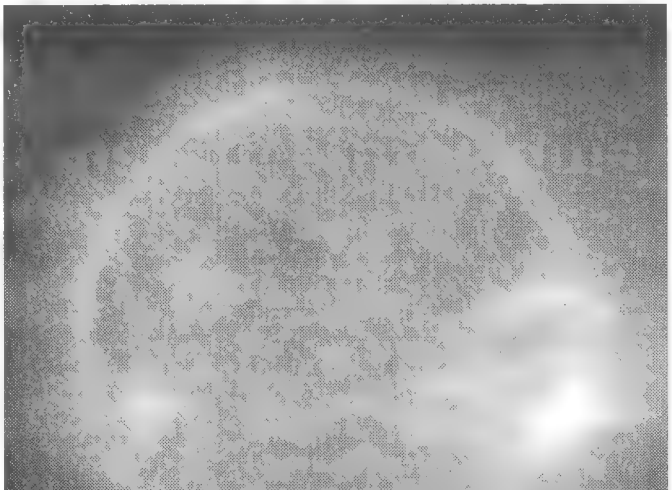
The observations of solar activity are essentially telling us how much energy is pouring out of the huge continuous thermonuclear fire that is the sun. A vast ball of hydrogen gas, condensing under the pull of its own gravity until the pressure on the hydrogen gas atoms is so great that some of them, those which happen to be under the greatest pressure, fuse together to form one atom of a slightly heavier gas and release a whole lot of energy in the process. This has been going on for a few billion years and will continue for some billions of years to come as the hydrogen is used up. Then the process will continue with the next gas, manufactured in the engine that is the sun, until progressively heavier elements are created and used up. This, by the way, is how every element has been manufactured. The iron in a magnet was made in a star a very long time ago and has been recycled into space when the star which made it went nova and blew up, scattering the results of its cooking far and wide. Some drifted into a cloud that condensed under gravity. Too small to form another star, it became the Earth which now provides a home for radio amateurs.

Some of the energy which is lost from the sun as it cooks away goes into space in the form of light in the ultraviolet part of the electromagnetic spectrum. This high energy radiation breaks the molecular bonds of the gas molecules that are up in the highest levels of the atmosphere and they become ions, no longer an atom in which the electrical charges of the particles which they are made of are equal and cancel each other out; there in an imbalance and the ions are electrically charged and subject to magnetic influence.

Electromagnetic radiation of certain frequencies, when encountering this area of the ionosphere, energized by the rays of the sun, will reflect off of it and bounce back down again.

When a ray of light or electromagnetic energy of whatever frequency strikes something which acts as a mirror to it the angle of incidence of the energy to the reflector is equal to the angle at which it bounces off. So if we send a flow of electromagnetic energy up to the ionosphere at a low angle of incidence, right down low to our horizon, it will bounce off that reflective layer, which is very high up and therefore quite far away, at the same small angle as it strikes it and reflect back to earth even further away. The radio amateur, who happens to be listening at that far away place can tune to the frequency of the reflected energy and, all being well, hear our signal. If we can reach them then they should be able to call us back by the same path until the reflectivity breaks down due to the instability of the atmosphere which at high altitude, as at the lower levels, is always swirling about.

The activity of the sun has been systematically observed only since as recently as about 1750. In the life of the sun we have been making and recording scientific observations for a brief time. This middle-aged star has, during that time, been exhibiting an 11 year cycle of increasing and decreasing sunspots.



Our unpredictable sun launches another mega-flare

Sunspots are bubbles of gas from below the surface of the sun. A bit cooler than the surface, they appear as dark spots. The first cycle that was recognized and recorded as cycle 1, started in 1755. The cycles are, on average, of 11 years duration, but have varied from 7 to 17 years. We are now in the downswing of cycle 23 and the average number of sunspots per month at the start of 2004 is about 60 and decreasing. Despite this, we have recently seen some quite major solar eruptions with not only sunspots but also ejections of gas many times larger than the Earth. Although these occur mostly around the peak of a cycle, they may be observed at any time, indicating that the sun does not feel obliged to obey some rules of behaviour that we have thought up for it, based on our relatively brief observations.

This is a large and ancient system and we may have been observing for such a relatively short time that there are longer-term cycles we have not yet identified.

Recent research, now in press and probably published in Physical Review Letters by the time you read this, indicates that the sun is now more active than it has been for a thousand years. In October and November, 2003, the sun was extremely active and was putting out such an amount of energy that those operators of large antenna systems called power grids had to adjust their protective systems to stop the circuit breakers from tripping out when the moving magnetic field encountered their wires and induced a current in the wire just as Michael Faraday demonstrated. In this case it was an increased current, perhaps an overload of the system such as occurred in Canada in 1989 when major blackouts resulted. The cause of the Canadian blackouts was eventually identified and it was realized that the long wire runs in that part of the world made the grid there especially vulnerable.

A group of scientists led by Ilya Usoskin at the University of Oulu in Finland, in cooperation with the Max Plank Institute for Aeronomy in Katlenberg-Lindau, Germany has concluded that there have been more sunspots since the 1940s than for the past 1150 years.

Since sunspot observations only go back about 250 years, they needed to come up with a method to find out what the sun was doing back 900 years before records are available. What they did was ingenious.

Ice cores taken in Greenland and Antarctica provide a preserved sample of what was in the atmosphere when new ice layers formed each winter. The cores provide a record of the concentration of beryllium-10 in the atmosphere. This is produced when high-energy particles hit the upper atmosphere. When the sun is more active, its increased magnetic field protects the Earth from these particles and levels of beryllium-10 are reduced.

Beryllium-10 is scarcer in recent times than it has been for a very long time. This indicates that the sun has been more than usually active since 1750, with a dip in output about 1850.

We cannot control the sun, perhaps we cannot really predict its activity based on the last 250 years of observation either. If the evidence from the ice cores is being correctly interpreted, it may be that our hobby will need to evolve to suit the changing circumstances.

It seems that we have been observing an active stage of the sun that happens to have been occurring since people started recording sunspot activity.

The big question is how long will it continue? It would be unrealistic to assume that there will be another upswing starting in 2007 just because that is when our recent observations suggest that is when it is "due". It may come or it may not. If it does, well and good. If not, there may be a steep drop-off of solar output, as occurred in the 1650s and 1660s, when 1665-66 was a year described as being "without a Summer" and the river Thames froze in London. Such minimums were found in 1450 and 1050 as well. Solar minimums in 1050,1450,1650 and 1850 are suggestive of a longer cycle. There is a gap with a double-dip in the period 1250 to 1350 that perhaps shows only that there is no totally consistent pattern.

Whether these oscillations correlate with cold weather or not is the subject of a major scientific debate and it is too soon to know the answer. What we do know is that high frequency radio propagation would be diminished with reduced solar output.

The message is that we cannot be confident that the period of high solar activity of the last 250 years is not at an end. We are due for a major downturn. Whatever it may do to the climate, to the potential annoyance of those warning of global warming, we do know that high frequency radio communication would be adversely affected.

We cannot control the sun, perhaps we cannot really predict its activity based on the last 250 years of observation either. If the evidence from the ice cores is being correctly interpreted, it may be that our hobby will need to evolve to suit the changing circumstances.

Technical Abstracts *continued*

A QRP ATU

continued from page 49

The completed inductors were soldered directly to the panel mounted toggle switches. Remember that this ATU is only intended for relatively low powers of 10-25 W maximum. Saturation and/or overheating of the cores may take place if higher powers are used. Six small DPDT toggle switches are used to select any combination of inductors in a binary sequence. The switches are arranged so that in the UP position they open circuit the coil and bypass it. In the DOWN position, they connect the associated coil in series with the circuit.

Input and output tuning capacitors, (C1 and C2) are air-spaced AM tuning capacitors of 500 pF range (30-530 pF). If available, it may be better to use dual or triple gang capacitors to extend the range of impedance matching. For the rated power levels of, say, up to 25 W, normal plate spacing should be adequate.

Tables 2 shows the typical switch settings for each of the HF bands for the half-sized G5RV. Table 3 show the switch settings for the same antenna used as a Marconi antenna tuned against ground.

Most modern transceivers have solid state output stages with adjustable power output and also have VSWR sensing circuits which reduce power output as the VSWR rises. Therefore, the tuning of the ATU should be carried out with the minimum power levels that will give a display of the VSWR value. The tune up procedure involves progressively increasing the inductance value by operating the associated toggle switch and adjusting the input and output capacitances for lowest VSWR.

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

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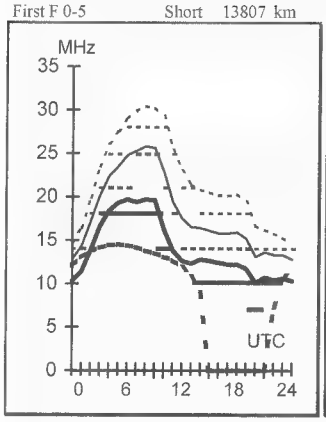
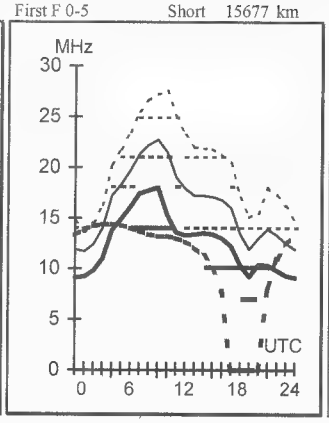
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

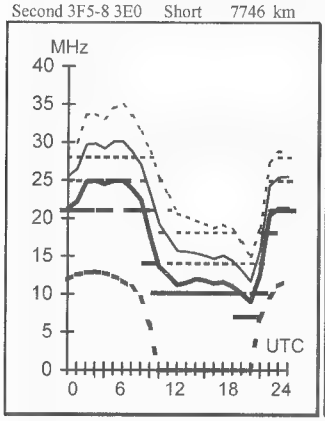
Adelaide-Moscow 318
First F 0-5 Short 13807 km



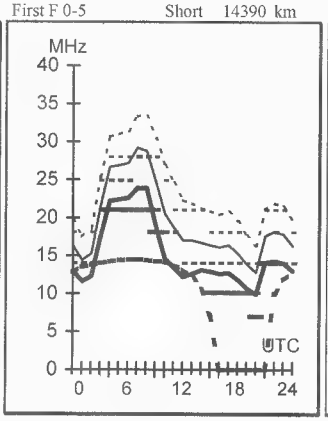
Brisbane-Berlin 148
First F 0-5 Short 15677 km



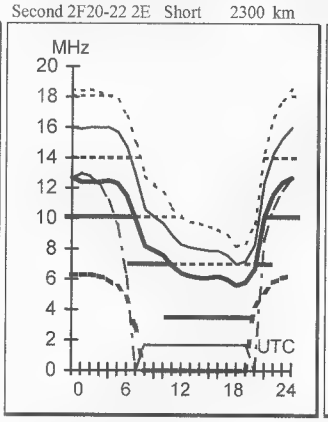
Adelaide-Osaka 357
Second 3F5-8 3E0 Short 7746 km



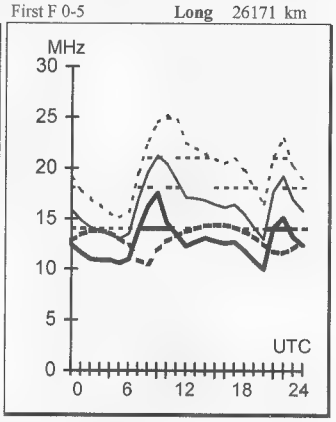
Brisbane-Cairo 288
First F 0-5 Short 14390 km



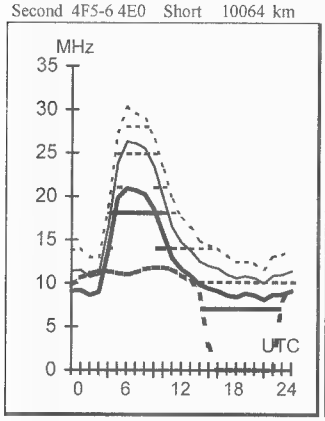
Canberra-Auckland 102
Second 2F20-22 2E Short 2300 km



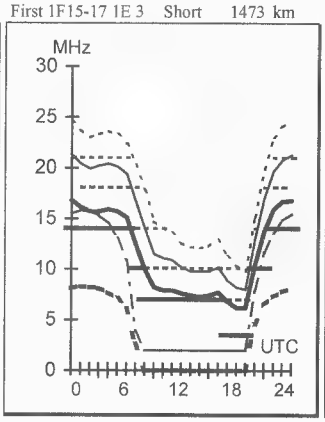
Darwin-London 145
First F 0-5 Long 26171 km



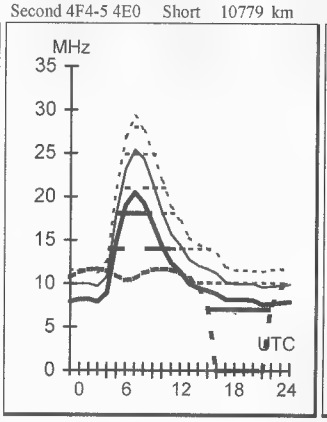
Adelaide-Pretoria 238
Second 4F5-6 4E0 Short 10064 km



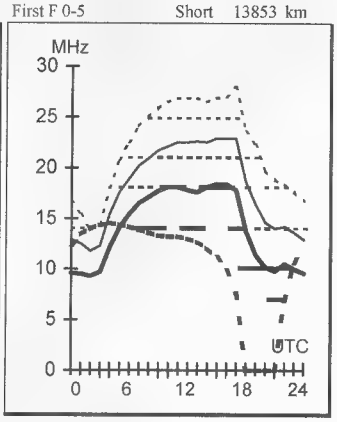
Brisbane-Noumea 70
First 1F15-17 1E 3 Short 1473 km



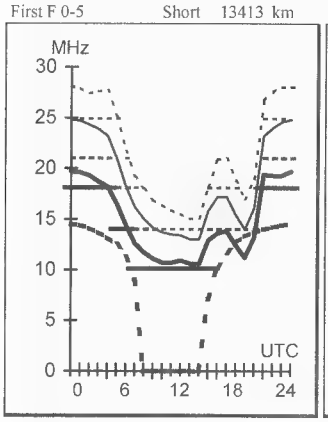
Canberra-Capetown 219
Second 4F4-5 4E0 Short 10779 km



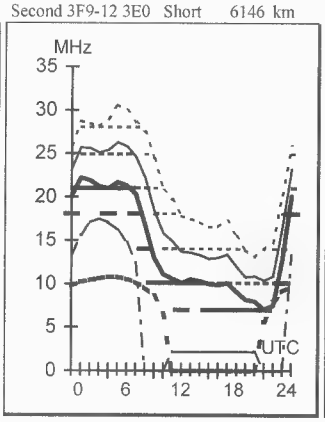
Darwin-London 325
First F 0-5 Short 13853 km



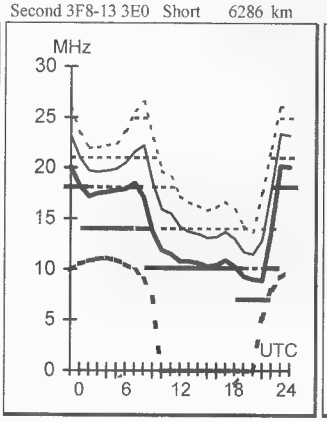
Adelaide-Seattle 51
First F 0-5 Short 13413 km



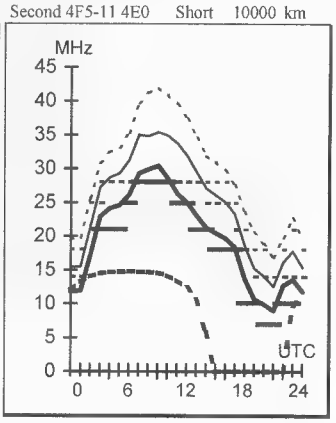
Brisbane-Singapore 293
Second 3F9-12 3E0 Short 6146 km



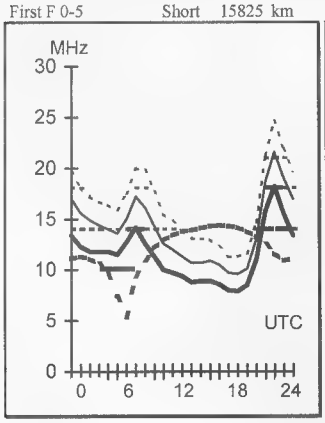
Canberra-Manila 327
Second 3F8-13 3E0 Short 6286 km



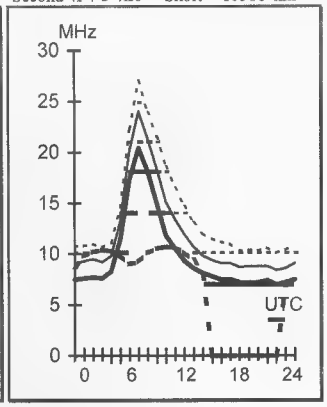
Darwin-Riyadh 295
Second 4F5-11 4E0 Short 10000 km



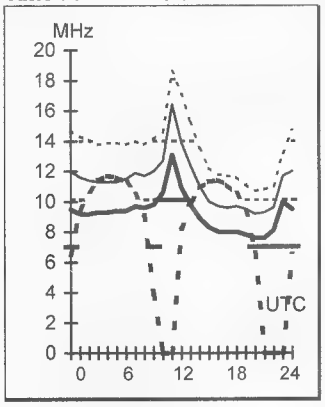
Hobart-Barbados 134
First F 0-5 Short 15825 km



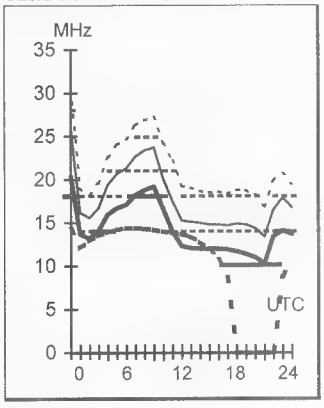
Melbourne-Capetown 222
Second 4F4-5 4E0 Short 10318 km



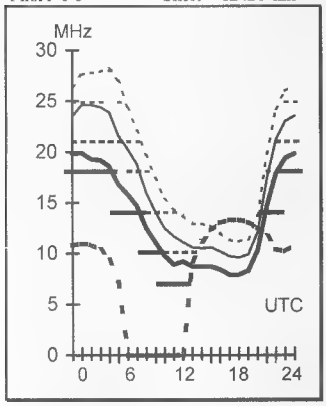
Perth-Buenos AiresHarare 185
First F 0-5 Short 12591 km



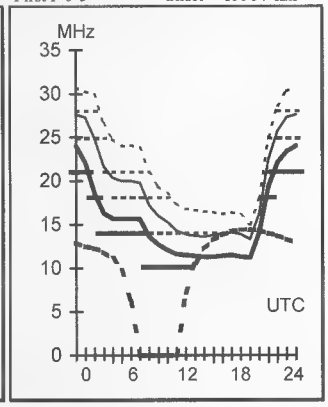
Sydney-Budapest 306
First F 0-5 Short 15779 km



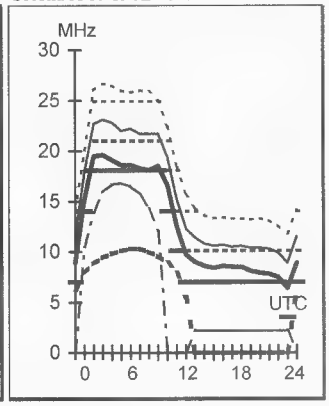
Hobart-Lima 133
First F 0-5 Short 12421 km



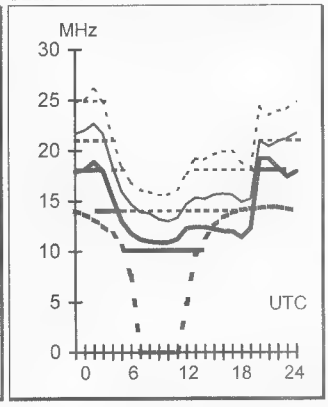
Melbourne-Miami 94
First F 0-5 Short 15584 km



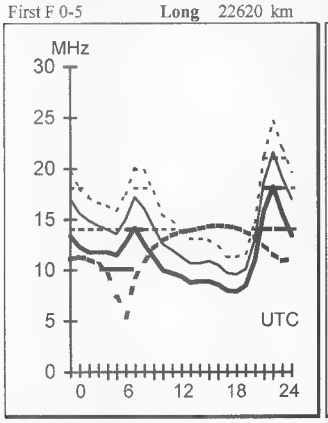
Perth-Columbo 312
Second 3F10-13 3E Short 5798 km



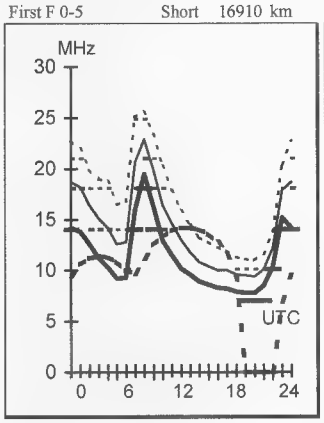
Sydney-Chicago 62
First F 0-5 Short 14876 km



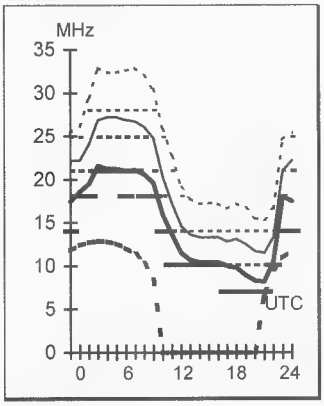
Hobart-London 123
First F 0-5 Long 22620 km



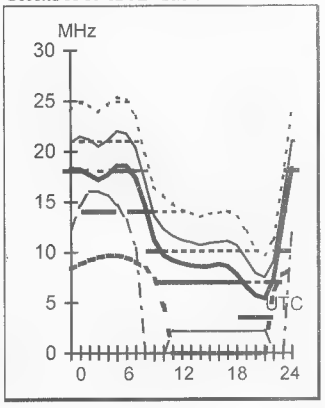
Melbourne-Senegal 219
First F 0-5 Short 16910 km



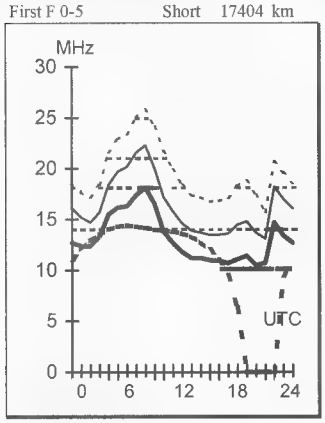
Perth-Osaka 17
Second 3F5-8 3E0 Short 7684 km



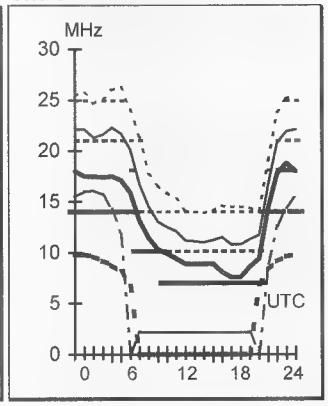
Sydney-Jakarta 294
Second 3F10-12 3E Short 5496 km



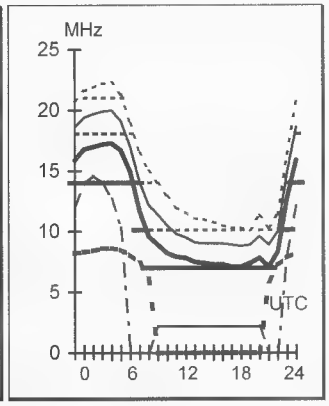
Hobart-London 303
First F 0-5 Short 17404 km



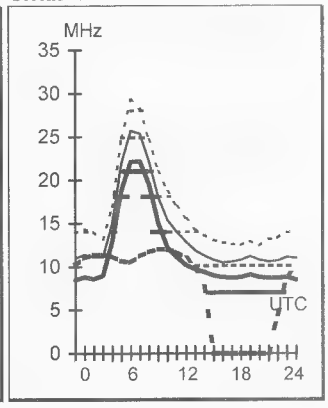
Melbourne-Suva 65
Second 2F9-11 2E0 Short 3914 km



Perth-Wellington 119
Second 3F11-13 3E Short 5255 km



Sydney-Pretoria 230
Second 4F3-4 4E0 Short 11063 km



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• **Shack clearout**: **Alinco 20A** pwr supply, $350. **Azden PCS-5000** 2 m FM xcvr, $450. **CD-100W** HF amp, $100. **Daiwa CR4 rotator** and controller $400. **Emtronics 25A pwr supply**, $400. **Emtronics EAT-300 ATU**, $150. **HF amp** & pwr supply, 2 X 3/500Z, 1kW, $650. **Icom IC-490** 70 cm all-mode xcvr, $350. **Icom IC-505** 6 m all-mode xcvr, $450. **Icom IC-726** HF, 6 m xcvr, $800. **Icom IC-735** HF xcvr & **AT-150 ATU**, $800. **Kenpro KR-5600A** Az, El, controller, $850. **Kenwood TS-430S** HF xcvr, $450. **Kenwood TS-440S** HF xcvr & pwr supply $850. **Kenwood TR-9130** 2 m all-mode xcvr, $300. **Racal RA-17L** Comms rcvr $350. **Tokyo high power HL-60U** 70 cm amp $300. **Tokyo high power HL-82V** 2 m amp, $250. **Tokyo highpower HL-86V** 6 m amp, $350. **Tokyo high power HL-160V** 2 m amp $600. **Tokyo high power HL-180V** 2 m amp, $650. **Tono 5000E** Keyer/Modem, $600. Bob VK2CAN, Phone 02 9416 3727

• **Test equipment**: **DSE AG2600A AF oscillator**, $75. **DSE/EA spectrum analyser**, 50-870 MHz, $100. **Hitachi V212** 20 MHz CRO, $200. **Leader LSW-250** sweep & marker generator, $150. **LT PC1200** 1250 MHz counter, $150. **Nemic Lambda 20 A** pwr supply, $40. **Nemic Lambda 43 A** pwr supply, $75. **Trio SG-402** signal generator, $100. Bob VK2CAN Phone 02 9416 3727

• **KLM antenna KT-34XA** partly disassembled with manual, $600 neg. **Drake L-4B** linear amplifier, new filters with manual, around $1400. Both plus shipping. Ted Baker VK2ABW Phone 02 6337 1219, fax 02 6337 1572, baker@ix.net.au

WANTED NSW

• **Wanted urgently**: **High frequency transceiver**, valve or solid state, working or not, by pensioner wanting to become active on air again! Anything considered, even old AM transmit/receive equipment. Must be inexpensive, or one that with work I might be able to get going. Not working, desk or old dynamic microphone sought also! Please contact Norm VK2ZG QTHR Phone 02 4341 1736 or email normvk2za@optusnet.com.au.

• **Flexible exhaust pipe** for ex-army **Onan Genset 2kVA model OTC-5B. Circuit/ handbook Zenith Trans-Oceanic Royal 7000**. **Handbook/circuit National** portable tape/radio/TV model **TR-5000A**. VK2SIG@macben.id.au QTHR.

• **Collins KWS-1** transmitter and/or **75A-4** receiver. Will collect locally or interstate. Phone Glen VK2FC on Phone 0427 624 028 or 02 4988 6565 or email to vk2fca@hotkey.net.au

• **HF solid state transceiver** Kenwood TS-430S, TS-140S or Icom IC-738, IC 737A cash buyer for right radio. James VK2UN vk2un@wia.org.su or Phone 0417 410 503

• **Free standing tower**, approx 60 ft or higher. Leigh VK2KRR Phone 0419 631199

FOR SALE VIC

• **Transceiver, Kenwood TS-130S**, HF 80 m, 10 m (including WARC bands) $299. **HF communications receiver, Yaesu FRG-7**, $99. All quoted prices are negotiable. Phone Terry VK3KBD Phone 03 9315 0186 (evenings only).

FOR SALE QLD

• **Yaesu FT-101B and FV-101** ext VFO **Kenwood TS-120S** with PSU $200. Paul Phone 07 4775 7998

WANTED QLD

• **Information and circuit diagrams for YU3UMV 23 cm transverter** and **Netset PRO-2028 scanner**. All costs repaid. Wayne VK4WDM. Email melrosew@optusnet.com.au Phone 07 4788 8781

• **For Townsville RAAF Museum: Donations of military comms equipment** and **an amateur SSB transceiver for our memorial station VK4KG**. Older rig in GWO OK. Wayne VK4WDM. Email melrosew@optusnet.com.au Phone 07 4788 8781

• **Geiger counter and TV transponder.** Please phone 07 5543 7212 or email nicholaschantler@yahoo.com.au

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• **Yaesu Classic FT DX-400** transceiver immaculate will demonstrate, with **3 band quad antenna, 35 ft tower**, motor cables etc, also **Ameritron AL-811x** 400 watt linear amplifier and other items all with manuals. Tom VK6TL Phone 08 9386 7692 QTHR

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• **Yaesu FT-857** new in box built in DSP unit offers $. **Yaesu MH-59A8J** DTMF mic, suit FT-857, $95, new in box unused. Allen VK7AN Phone 0417 354 410

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MISCELLANEOUS

• **The WIA QSL Collection (now Federal) requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

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Battery packs for older handhelds

Roy Yeats VK2BRY
16 Eungella Place
Orange 2800

The battery pack for a sixteen year old FT208R was well past its "use by" date and would not hold its charge. A new pack was unavailable. The original pack FNB-2 uses nine half AA NiCad cells in series giving 10.8 volts with a 450 mAH capacity.

I had no wish to use a pack rebuilder or try to source half AA NiCads after an unsatisfactory result. Perusing the local electronics catalogues showed that nine AAA size NiCads cells would fit. Also an acceptable voltage (11.25 volts) and a gain in capacity from 450 mAH to 550 mAH would be achieved. Using blank PCB material, a suitable box with an etched terminal arrangement was soldered together. The nine AAA cells stacked to fit the dimensional criteria of the original box.

Care is needed to accurately duplicate the critical dimensions of the original pack. To ensure proper fit in the handheld, no specific dimensions are given, as each situation would be different.

The overall cost would be somewhat less than a new pack if it were available.

The philosophy of the exercise may give new life to other models of handhelds with battery problems, by using a little ingenuity with readily available cells and easy mechanics.

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Division Directory

The Amateur Radio Service exists for the purpose of self training, intercommunication and technical investigation. It is carried out by amateurs who are duly authorised people interested in radio technique solely with a personal aim and without pecuniary interest.

The Wireless Institute of Australia represents the interests of all radio amateurs throughout Australia. National representation is handled by the executive office under council direction. There is one councillor for each of the seven Divisions. This directory lists all the Divisional offices, broadcast schedules and subscription rates. All enquiries should be directed to your local Division.

Broadcast schedules All frequencies MHz. All times are local.

VK1 Division Australian Capital Territory,
GPO Box 600, Canberra ACT 2601

President	Alan Hawes	VK1WX
Secretary	Deane Walkington	VK1DW
Treasurer	Bob Howie	VK1HBH

VK1WI transmits each Thursday evening at 2000 hrs local time on VK1RGI 146.950 MHz and 438.375 MHz including the linked repeater system on VK2RGN Goulburn, VK2RHR High Range, VK2RMP Madden Plains and VK2RTW Wagga Wagga.
VK1 Home Page *http://www.vk1.wia.ampr.org*
Annual Membership Fees. Full $80.00 Pensioner or student $71.00. Without *Amateur Radio* $48.00

VK2 Division New South Wales
109 Wigram St, Parramatta NSW
(PO Box 9432, Harris Park, 2150)
(Office hours Tue., Thu., Fri., 1100 to 1400 hrs.)
Phone 02 9689 2417
Web: *http://www.wiansw.org.au*
Freecall 1800 817 644 (NSW only)
e-mail: *vk2wi@wiansw.org.au*
Fax 02 9633 1525

President	Brian Kelly	VK2WBK
Secretary	Owen Holmwood	VK2AEJ
Treasurer	Noel May	VK2YXM

VK2WI transmits every Sunday at 1000 hrs and 1930 hrs on some or all of the following frequencies (MHz): 1.845, 3.595, 7.146, 10.125, 14.170, 18.120, 21.170, 24.950, 28.320, 29.170, 52.150, 52.525, 144.150, 147.000, 432.150, 438.525, 1273.500. Plus many country regions on 2m and 70cm repeaters. Highlights are included in VK2AWX Newcastle news Monday 1930hrs. on 3.593 , 10 metres and local repeaters. The text of the bulletins is available on the Divisional website and packet radio. Continuous slow morse transmissions are provided on 3.699 and 145.650. VK2RSY beacons on 10m, 6m, 2m, 70cm and 23cm. Packet on 144.850.
Annual Membership Fees. Full $83.00 Pensioner or student $66.00. Without *Amateur Radio* $50.00

VK3 Division Victoria
40G Victory Boulevard Ashburton VIC 3147
(Office hours Tue 10.00 -2.30)
Phone 03 9885 9261
Web: *http://www.wiavic.org.au*
Fax 03 9885 9298
e-mail: *wiavic@wiavic.org.au*

President	Jim Linton	VK3PC
Secretary	John Brown	VK3JJB
Treasurer	Jim Baxter	VK3DBQ

VK3BWI broadcasts on the 1st Sunday of the month at 1030 and 2000 hours. Primary frequencies are 3.615, 7.085, 10.130, FM repeaters VK3RML 146.700, VK3RMM 147.250, VK3RWG 147.225, VK3RMU 438.075. The broadcast can also be heard on the Saturday night at 2000 hours before the 1st Sunday. Major news appears on the packet radio network under the callsign VK3ZWI, and the WIA Victoria website.
Annual Membership Fees. Full $87.00 Pensioner or student $72.00. Without *Amateur Radio* $55.00

VK4 Division Queensland
PO Box 199, Wavell Heights, Qld. 4012
Phone 07 3221 9377
e-mail: *office@wiaq.powerup.com.au*
Fax 07 3266 4929
Web: *http://www.wia.org.au/vk4*

President	Ewan McLeod	VK4ERM
Secretary	Bob Cumming	VK4YBN
Treasurer	David Gulley	VK4DCG

EVERY SUNDAY, at 9am LOCAL (Sat 2300 UTC). From Far North Queensland On 7.070/2 MHz. From South East Queensland:- 1.825, 3.605, 7.118, 10.135, 14.342, 21.175, 52.525, 147.000, 438.500 MHz. Right throughout VK4 scan 146.6 to 148.0 MHz again at 9am local. SUNDAY 6:45pm hear LAST week's QNEWS broadcast 3.605 and 147.0 MHz from South East Queensland. MONDAY 7:00pm hear YESTERDAY's news again on 146.875 MHz broadcast from Brisbanes Bayside repeater, and then 7:30pm on 3.605 and 147.0 MHz from Sth East Queensland. Text editions on packet internet and personal email, visit www.wia.org.au/vk4 News is updated 24/7 in both text and audio on this site. MP3 Audio from same website by 2300 hours each Saturday. Contact QNEWS, packet sp QNEWS@VK4WIE.BNE.QLD.AUS.OC email qnews@wia.org.au
Annual Membership Fees. Full $95.00 Pensioner or student $81.00. Without *Amateur Radio* $63.00

VK5 Division South Australia and Northern Territory
(GPO Box 1234 Adelaide SA 5001)
Phone 08 8294 2992
web: *http://www.sant.wia.org.au*
email: *peter.reichelt@bigpond.com*

President	Trevor Quick	VK5ATQ
Secretary	Peter Reichelt	VK5APR
Treasurer	Trevor Quick	VK5ATQ

VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
Annual Membership Fees. Full $91.00 Pensioner or student $76.00. Without *Amateur Radio* $61.00

VK6 Division Western Australia
PO Box 10 West Perth WA 6872
Phone 08 9351 8873
Web: *http://www.wia.org.au/vk6*
e-mail: *vk6@wia.org.au*

President	Neil Penfold	VK6NE
Secretary	Roy Watkins	VK6XV
Treasurer	Bruce Hedland-Thomas	VK6OO

VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
Annual Membership Fees. Full $71.00 Pensioner or student $65.00. Without *Amateur Radio* $39.00

VK7 Division Tasmania
PO Box 371 Hobart TAS 7001
Phone 03 6234 3553 (BH)
Web: *http://www.wia.org.au/vk7*
email: *vk7dg@wia.org.au*

President	Phil Corby	VK7ZAX
Secretary	Dale Barnes	VK7DG
Treasurer	Dale Barnes	VK7DG

VK7WI: At 0930 hrs every Sunday on 146.700 MHz FM (VK7RHT, Hobart) and relayed on 147.000 MHz FM (VK7RAA, Launceston), 146.625 MHz FM (VK7RMD, Ulverstone), 146.750 MHz FM (VK7RNW, Ulverstone), 147.075 MHz FM (VK7RWC, Rosebery), 3.57 MHz LSB, 7.090 MHz LSB, 14.130 MHz USB and UHF CB Channel 15 in Hobart area.
Annual Membership Fees. Full $90.00 Pensioner or student $77.00. Without *Amateur Radio* $57.00

VK8 Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown, received on 14 or 28 MHz. The broadcast is downloaded via the Internet.

Seasons at Mt Baw Baw

Chris Morley VK3KME
Secretary
WIA Eastern Zone Amateur Radio Club

The winter photos were taken in July and August 2003 (see also photo on front cover) when I travelled by cross-country skis to the summit to replace the transceiver. It took two trips spread over a couple of weeks to achieve this, as I was not successful gaining access on the first attempt. The summer photo (below) was taken in February 2004 on another repeater maintenance trip.

The VK3RWG 2 metre repeater site at Mt Baw Baw in Gippsland.

The Mt Baw Baw repeater, which operates on 147.225 MHz, provides good radio coverage over virtually all of West Gippsland (hence the R**WG** call sign), much of Central and South Gippsland and well into Melbourne. Repeater output power is about 15 watt into a 3 dB collinear antenna. The repeater is co-located with a number of other services near the summit of Mt Baw Baw in an air-conditioned hut, previously used for pay TV and now owned by a phone carrier.

Mt Baw Baw, at 1564 metre above sea level, is one of the highest amateur radio repeater sites in the country, and stands well above any other nearby mountains, except for Mt Erica at the eastern end of the Baw Baw plateau. The alpine climate provides snow cover for a good deal of winter much to the delight of both cross country and alpine skiers. Many day-trippers from Melbourne make the 2 – 3 hour journey to the ski resort in winter.

The repeater is maintained by the WIA Eastern Zone Amateur Radio Club which is based in the Latrobe Valley. Other devices maintained by the WIAEZARC include the 2 metre and 23 cm Mt Tassie repeaters (VK3RLV), the Carrajung 70 cm repeater VK3RGU, and beacons on 2 metre, 70 cm and 23 cm also at Carrajung. Most of the repeater and beacon work is undertaken by the Club's Repeater Officer, Ralph Edgar VK3WRE.

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